WAYSIDE AND WOODLAND BLOSSOMS

A POCKET GUIDE TO BRITISH WILD FLOWERS · BY EDWARD STEP F.L.S

Coláiste an Ċro'ḋe Ró Naomṫa
1488

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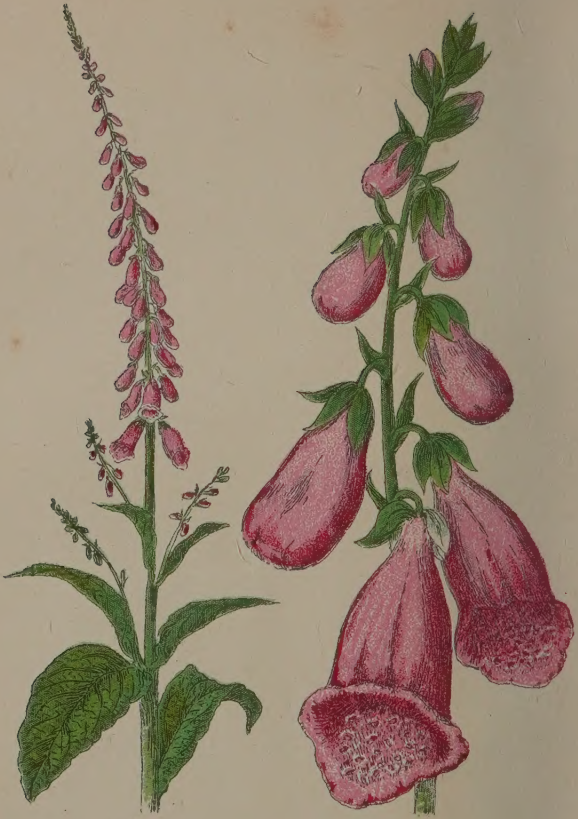

Foxglove.
Digitalis purpurea.
SCROPHULARIACEÆ.

2 *Pl.* I

Frontispiece

Wayside and Woodland Blossoms

A POCKET GUIDE TO BRITISH WILD-FLOWERS FOR THE COUNTRY RAMBLER

(SECOND SERIES)

New Edition

WITH CLEAR DESCRIPTIONS OF 366 SPECIES

BY

EDWARD STEP, F.L.S.

AUTHOR OF

"WAYSIDE AND WOODLAND TREES," "WAYSIDE AND WOODLAND FERNS," ETC.

WITH

COLOURED FIGURES OF 130 SPECIES BY MABEL E. STEP

Coláiste an Ċroiḋe Ró Nao
1488

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BY THE WAY.

"NEARLY every season I make the acquaintance of one or more of our wild-flowers. It takes years to exhaust the botanical treasures of any considerable neighbourhood, unless one makes a dead set at it like a herbalist. One likes to have his floral acquaintances come to him easily and naturally, like his other friends. Some pleasant occasion should bring you together. You meet in a walk, or touch elbows on a picnic under a tree, or get acquainted on a fishing or camping-out expedition. What comes to you in the way of birds and flowers while wooing only the large spirit of open-air nature seems like special good fortune. At any rate, one does not want to bolt his botany, but rather to prolong the course. One likes to have something in reserve, something to be on the look-out for in his walks."—JOHN BURROUGHS.

INTRODUCTION.

A COMMON complaint made to botanists by unscientific flower-lovers refers to the difficulty of acquiring a knowledge of Botany. They fear a bogey in the shape of the dreadful words of Greek or Latin origin, and what they consider the involved system of classification into classes, orders, genera, and species ; but, like most other bogies, this one is easily put to flight by a slight exhibition of courage. The white sheet spread across a post to frighten the timid turns out on close inspection to be a chart of the Vegetable Kingdom, making exploration easy, and the post itself is a guide-post ! We do not suppose that our readers will experience any serious difficulty respecting the few, though oft-repeated, technical terms and the scientific names introduced in the two volumes of this work ; and if that is so, we may surely go so far as to counsel them to study some simple manual of structural botany, such as Sir J. D. Hooker's "Primer of Botany," published by Macmillan and Co. After such study, elementary though it be, they will find that not only the blossoms, but all other portions of the plant also, are full of interest. In truth, such rudimentary acquaintance with the *plant* as a whole—how it came to be, how it is built up, how it lives and grows and plays its part in the work of the universe—is really necessary before we can fully appreciate all the beauty of flower structure.

From the many references in these pages to the various methods by which cross-fertilization is effected, the reader will have learned that the great differences of form and colour existing between flowers have a far more serious significance than the mere desire for variety. Gray in his famous "Elegy" wrote—

> "Full many a flower is born to blush unseen
> And waste its sweetness on the desert air."

In these lines Gray reflected the narrow view prevailing until quite recently, that the sole *raison d'être* of the flower's beauty and fragrance was that it might minister to man's pleasure; therefore, the flower that expanded where the eye of man could not behold it was wasted. Were he living, Gray would almost certainly rewrite or expunge those lines, for it is now clear that the tastes of the nectar-seeking, pollen-carrying insects have had greater weight in the evolution of the flower than had man's æsthetic sense. Further, the fragrance of the desert flower we now know to be *primâ facie* evidence that insects also exist in that desert; and should the appropriate insect come to the flower and taste of its nectar, we know that the fragrance has not been wasted, though no human foot ever passed that way. Our increasing knowledge of the intimate relation between the forms of insects and the structure of the flowers they visit should furnish the poets with quite a new set of images.

In the First Series (2nd and later editions) of this work we have given a description of the parts of a flower, with a brief account of the principal kinds of flower-grouping (*inflorescence*); and our readers would not thank us for now traversing the same ground. It may be pointed out, however, that in most cases this grouping has been directly influenced by commerce between plant and insect. The smaller blossoms co-operate among themselves with the object of rendering them conspicuous, though individually they are insignificant. Most Umbelliferous plants, such as Wild Carrot, Fool's Parsley, Hogweed, have minute white or yellow flowers ; yet by the simple expedient of mounting these flowers upon radiating footstalks of varying lengths, a hundred or more flowers are brought close together on a common level, and they thus form some of the most conspicuous flower-masses of our hedgerows. Here, too, the honey is so exposed on open discs that it is accessible to the short-tongued flies and small beetles, but in consequence cannot be obtained with ease by the long-tongued bees and butterflies. Hermann Müller found that of 118 species of insects visiting the flowers of Hogweed (*Heracleum sphondylium*) there was not a single butterfly or moth : there were 13 kinds of bees, 49 kinds of flies, and 56 species of beetles and other insects. His tabulation of the visitors to other species of Umbellifers gives similar results ; but in the more compact flower-heads of Composite plants, with their longer tubular florets, the proportions are changed in favour of the long-tongued insects. Thus, of 93 species he noted as visitors to the Dandelion (*Taraxacum officinale*), 7 were butterflies or moths, 58 bees, 21 flies, and only 7 representatives of other orders. As we have shown in the following pages, there are flowers in which the honey can be reached only by insects with very long tongues ; others only by short-tongued wasps. Bearing these points in mind, when the rambler comes across what may be to him a new flower, it will be in numberless cases no very difficult matter, after a careful examination of the corolla, and the relative positions of the anthers, stigma, and honey-secreting organs, to say, "This flower is most probably fertilized by a hawk-moth," a bee, a wasp, or by various minute insects, as the case may be.

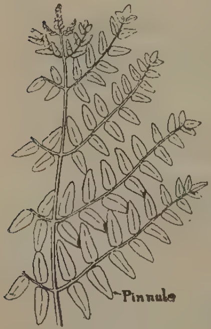
Such guesses as these, of course, imply a knowledge of insect form, and this the genuine lover of flowers will seek to obtain by observation at the same time as he is searching for the blossoms. Botany and Entomology are intimately related at many points, and they are two branches of Natural History that can be pleasantly and easily studied side by side. He will find that many flowers lay themselves out specially to attract the night-flying moths, and with this object in view they are most frequently pure white, and therefore very conspicuous. He will be particularly struck with this specialization when he considers the difference it makes between members of the same genus, where one adapts itself for diurnal, and another for nocturnal insects. *Lychnis dioica*, the common Red Campion, flowers by day, and its crimson corolla is conspicuous in the hedgerow. The very similar in form, White Campion (*L. alba*), opens its new flowers only in the evening, when it also becomes fragrant. Its flowers are pure white, and at night-time they appear almost luminous against the dark background of the field-hedge. So like are these two nearly related species that Linnæus associated them as two varietal forms of one species; and some modern botanists so regard them still.

But not only are plants specially adapted to encourage the visits of particular groups or even species of insects, and to profit by those visits; many of them take pains to exclude unprofitable insects of the smaller fry, who would simply steal honey or pollen without rendering any service in return. And so when Nature makes the tubular bell of Foxglove (*Digitalis purpurea*) just sufficiently large to enable a big bumble-bee to enter and well dust itself with pollen, she also takes care to plant a barrier of long hairs in the entrance which small insects cannot pass. The mechanical arrangements in the diverse, yet similar Leguminous plants, in the Barberry, the Violet, and many Orchids, are all to be considered with an eye to their cross-fertilization by insect agency. Should the reader come upon a plant whose flowers exhibit a peculiarity of structure, or some singular detail in which it strongly differs from others obviously related to it, he will almost certainly find, on carefully investigating the case, that some insect is "at the bottom of it." Then again, the period of opening and closing of the flower has relation to the time of day at which the pollen-carrying insect flies; the splashes and streaks of colour all run from the open part of the flower towards the honey-glands to serve as guiding lines; the very manner in which a flower is hung might be similarly explained in many cases, probably in most or all, were our knowledge of the subject more perfect.

We believe that the specific instances we have given of these mutually profitable adaptations of plant and insect will serve to whet the appetite of the reader, and make him desirous of a deeper knowledge of what one may term the Newer Botany, and will set him more closely considering the growing plant before he plucks the flower. The too common notion of scientific Botany is that it is a matter of bundles of hay, labelled with barbarous and arbitrarily chosen names; but the notion is a wrong one. No doubt there are some botanists who attach greater importance to the study of herbarium specimens than to the observation of the growing plant; but, necessary as herbaria are as affording type specimens for examinations at all seasons, the Botany of to-day is an outdoor science that has to do with living Nature, and the outdoor botanist is made acquainted with "fairy tales of science" no whit less wonderful or less interesting than the fairy tales of the astronomer, the geologist, the chemist, or the electrician. Another common error consists in the supposition that one cannot get to know the Natural History of the wild flowers without a course of laboratory work and the making of "a collection"—a *hortus siccus*—an idea that has prevented many persons with a love of flowers from attempting to make themselves acquainted even with the flora of their own neighbourhood. The author has received abundant testimony from readers of previous editions of this work, that it has at least taught them to know the wild flowers of their walks and the principal facts of their history. Such persons have not had the faintest inclination to make a collection of dried plants; and it must be confessed that the collecting botanist is, only too often, so intent upon getting specimens that he fails to note the interesting facts in the life history of the plants he gathers. Such collecting has little to justify it beyond the fact that it may keep the collector out of mischief.

It is the author's hope that of many who will take up these volumes simply with the object of identifying the common blossoms of the woodland and the wayside, some will find in its pages a few suggestions that may encourage them to proceed further, until they enter upon a serious study of the whole subject of plant life. When this stage is reached it will be found easy, by means of the Family Characters and the Classified Index at the end, to advance to a more systematic knowledge of the British Flora as a whole.

As in Series I., we append an explanation of technicalites used in the following pages :—



Bipinnate Frond.

Achene.—A fruit like a little nut; a single carpel containing a single seed.

Axil.—The angle between a stem and the upper side of a leaf-stalk.

Axillary.—Growing in the axil.

Bipinnate.—When *pinnæ* (*see* below) are themselves pinnate.

Bract.—A modified or reduced leaf beneath a flower or flower-cluster.

Bracteole.—A diminutive bract.

Carpel.—A division of the ovary or seed-vessel.

Cauline leaves.—Leaves arising from a stem as contrasted with those (*Radical*) which spring directly from the rootstock.

Cladode.—A modified branch, resembling a leaf.

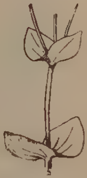
Cleistogamic, or *cleistogene.*—Flowers devoid of a corolla, and whose sepals never open, but which develop into fruits, nevertheless, as the result of self-fertilization.

Compound.—A leaf broken up into several leaflets. *Decompound.*—The leaflets themselves similarly broken up.

Connate.—When the bases of the opposite leaves are grown together.

Digitate.—Leaflets distinct, radiating trom the leaf-stalk.

Dimorphic.—Used of flowers that appear in *two forms*, such as the Primrose, in which one form has a short style with anthers near the mouth of the corolla-tube, and the other form has a long style and anthers midway down the tube.



Connate Leaf.

Diœcious.—When staminate and pistillate flowers are borne by different plants of a species.

Entire.—Having the margin undivided.

Filament.—The stalk-like portion of the stamen, supporting the anther.

Follicle.—A dry one-celled and one-valved fruit containing more than one seed.

Genus.—An assemblage of species which all agree in *one* important though minor structural character, and all bear the same primary name. Plural, *genera.*

Glume.—A chaffy envelope containing the essential organs of grasses.

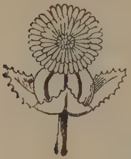
Hypogynous.—When petals or stamens spring from beneath the base of the ovary, and are not attached to the calyx.

Inferior.—Used to denote that the calyx or corolla is free from and below the ovary.

Inflorescence.—The arrangement or grouping of the flowers on a plant.

Involucre.—A series of bract-like leaves below a cluster of flowers. *Involucral.*—Pertaining to the Involucre.

Linear.—A leaf that is long and very narrow, with parallel sides.


Involucre.

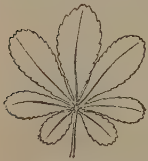
Lyrate.—Deeply-lobed so that the outline is similar to that of a lyre reversed.

Monœcious.—Staminal and pistillate flowers produced by the same individual.

Node.—A point of the stem whence leaves arrive.

Order.—A group of *genera*, all of which agree in some striking particular; such as *Cruciferæ*, in which there are twenty-five British genera and about seventy species, all agreeing in the possession of four petals arranged cross-wise.

Palmate.—Lobed in the form of a hand.


Palmate Leaf.

Pappus.—The calyx of Composite flowers; usually a whorl of bristles or silky hairs.

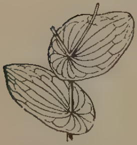
Pectinate.—Arranged like the teeth of a comb.

Perfoliate.—When a stem passes through the base of a stalkless leaf.

Perigynium.—The floral envelope of a *Carex*.

Phyllaries.—Bracts or scales that form the involucre to a head of Composite flowers.

Pinnate.—When the leaf is broken up into four or more distinct leaflets, arranged in two series along the midrib; as in the leaf of Lady's Smock. Each leaflet is called a *pinna;* plural *pinnæ*.


Perfoliate Leaf.

Pinnatifid.—When the leaf is deeply cut into a number of opposite lobes, which are connected with the midrib by the whole width of their bases. Example, Water Violet (Plate 37).

Proterandrous.—When the stamens mature before the stigmas.

Proterogynous. — When the stigmas mature before the stamens.

Radical leaves.—Leaves that arise directly from the rootstock, unconnected with stem or branch.

Scape. — A flower-stalk, usually leafless, arising directly from the rootstock.

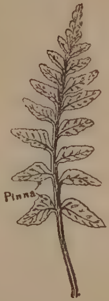
Scarious.— Dry and translucent.

Sessile.— Connected with the stem without an intervening footstalk. Used both of leaves and flowers.

Simple.— An unbranched stem ; an undivided leaf.

Spadix.—An inflorescence where the flowers are arranged around a thick fleshy spike. Example, Cuckoo-pint (Plate 117).

Spathe.—A large leafy bract enclosing a cluster of flowers.



Pinnate Frond.

Species.—Individuals bearing almost absolute likeness between themselves ; varying only to a comparatively slight extent, possibly in size or colour.

Spreading.—When the petals of a flower open till they are at right angles with the central column they are spreading. Hairs standing out horizontally from a perpendicular stem are spreading.

Stipules.—Bract-like processes in pairs at the base of a leaf-stalk.

Terminal.—Flowers produced at the summit of a stem or end of a branch.

Versatile.—When the anther is connected to the filament by the centre of its back, so that it swings freely, as if balanced on a pivot.

WAYSIDE AND WOODLAND BLOSSOMS.

Foxglove (*Digitalis purpurea*).

(*See* FRONTISPIECE.)

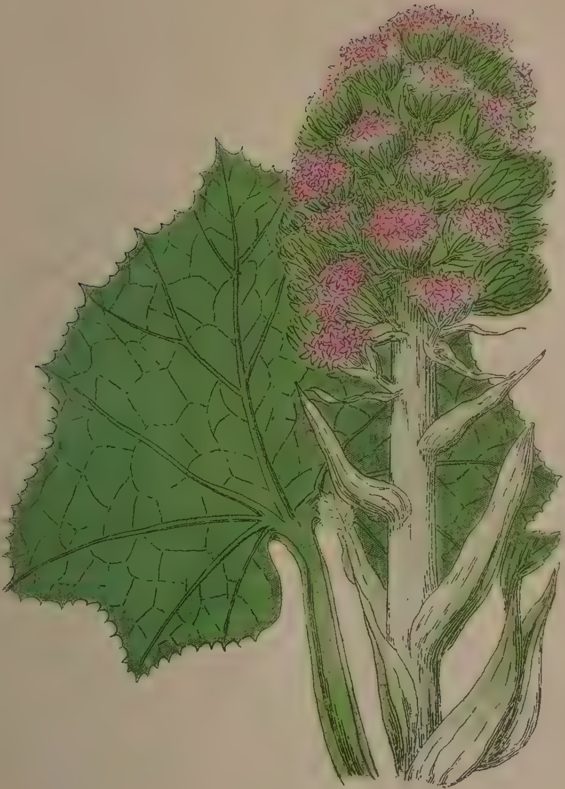
IN their first year there is sufficient general resemblance between the clumps of leaves of this plant and those of the Mullein, that those who are not botanists are frequently confused. Yet a very slight examination should be sufficient to separate them accurately; that of the Foxglove, though softly downy, is thin textured compared with the thick blankety feeling of Mullein; it is also minutely wrinkled above, whilst below the network of ribs and nervures stands out in bold relief. Those from the root only are stalked; those on the stem are alternate, and gradually pass into bracts, from the axils of which the large, broadly tubular flowers droop. The corolla is usually bright purple, speckled and spotted within, but sometimes it occurs orange or yellow, more frequently white. The four stamens are in two pairs, at first with the anther-cells horizontal, but as they ripen (the long pair first) the cells assume the perpendicular position. The stigma is not mature until the pollen has been shed. The hairs in the corolla-mouth prevent the shed pollen falling out, as well as keeping out minute honey stealers. Fertilization is effected by humble-bees who come after the honey, and their hairy bodies brush up the pollen and convey it to the stigma of an older flower. The plant is in flower from June to September, and it is a magnificent spectacle that is presented in the height of the flowering period where the Foxglove is really at home. It shows best on banks and woodland slopes, and we have very vivid recollections of it on scarcely accessible terraces of the sand escarpments of the Leith Hill range in Surrey. But we have seen no show equal to that of certain moorland roads in Cornwall, where it stood majestically, close-ranked, all up and over the thick rounded hedgebanks without hedges ; and the eye could follow the broad masses of colour for miles. One felt that even the art of the modern landscape-gardener could compass nothing so grand in its unstudied richness of effect.

Name from the Latin, *digitale*, a finger stall or thimble, from the form of the flowers.

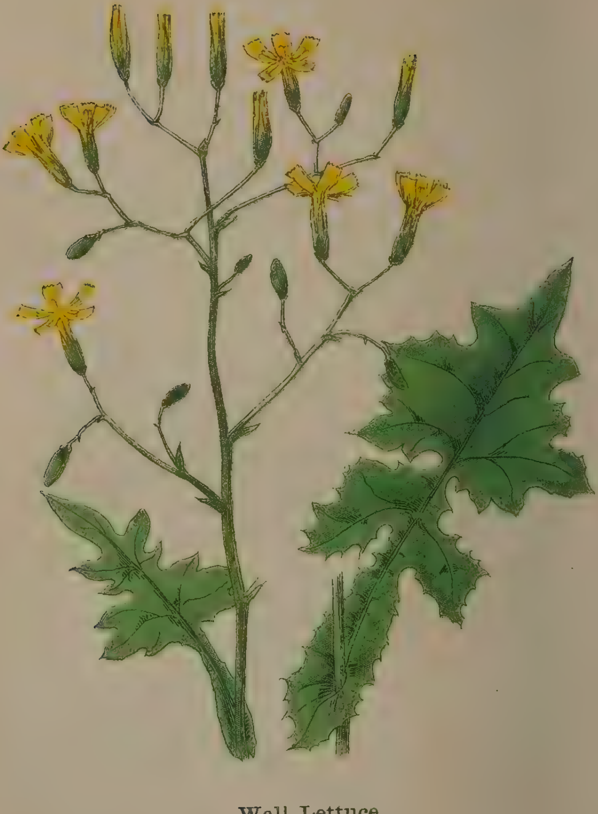
Butterbur (*Petasites vulgaris*).

Formerly included in the same genus with the Colt's-foot (*see* First Series, p. 136), but now separated from it, the Butterbur shows its affinity in the general character of its much larger leaves and its habit of flowering before foliation. In Butterbur the individual flesh-coloured flower-head is much smaller than that of Colt's-foot, and there are male heads and female heads ; though the male heads contain a few female flowers, and the female heads a few males. The two forms of flowers are produced by separate plants. The male floret is bell-shaped, the mouth cut into five lobes ; the female is a long slender tube with an obliquely-cut mouth and a protruding pistil. All the flower-heads are gathered into a large dense panicle, contained in two very large bracts.

After the flowers come the leaves, which are, roughly speaking, kidney-shaped with irregular teeth. This is the leaf dear



Butterbur.
Petasites vulgaris.
COMPOSITÆ.



Wall Lettuce.
Lactuca muralis.
COMPOSITÆ.

to children, who, finding it in damp meadows and on green roadside wastes, appropriate it for sunshades and sun-bonnets, for it often attains a diameter of 3 feet. Like those of the Colt's-foot, it is white underneath, and cobwebby both above and below in its young state, but the upper surface afterwards becomes clean. As befits so umbrella-like a leaf, it has a long thick handle in the shape of a leaf-stalk. It flowers from March to May, and is a boon to bee-keepers, for its numerous flowers are rich in honey. It is said that the bee-farmers in Sweden plant it near their hives on this account.

The generic name is derived from a Greek word signifying an umbrella or head-covering, suggested by the use to which children put it, as indicated above. This is the only British species ; but *P. fragrans* (Winter Heliotrope), a sweet-scented Continental species, is naturalized on many roadside banks in the South of England. It flowers from December to February; but at other seasons may be passed over as Colt's-foot.

Wall Lettuce (*Lactuca muralis*).

Our native flora comprises no fewer than five species of wild Lettuce, but it must not be assumed that either of these is the origin of our garden Lettuce. In this country alone this has been cultivated for nearly three hundred and fifty years, and during that period it has become so modified and run into so many varieties that it would be difficult to make out its pedigree ; but it is thought the original may be looked for in *L. scariola*. *L. muralis* is the most frequent and most widely distributed of the native species, but cannot be described as an abundant weed. It is often found in the places suggested by its name, but also in the hedgerow and on rocky banks. It is a smooth annual or biennial, with tall slender stem (as much as 3 feet) ; the leaves are of the pattern known as *lyrate*, or lyre-shaped, from a fancied resemblance between its outline and that of Apollo's favourite instrument. The upper part is much lobed and jagged at the edges, whilst the lower portion is greatly attenuated; its substance is dry and thin. The flower is a composite, and the heads are small, with strap-shaped outer rays of yellow hue. It flowers from June to August. The other species are :—

I. Stinking Lettuce (*L. virosa*). Tall, erect, growing as high as 6 feet. With prickly, glaucous leaves, branching stem, and spreading panicle of small pale yellow flowers. The upper leaves clasp the stem, and the few bracts have red tips. Banks and wastes, flowering in July and August. Not at all common; rare in Scotland.

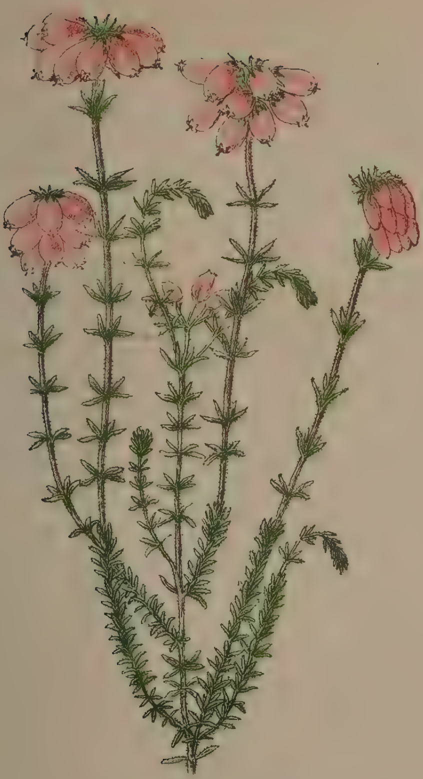
II. Prickly Lettuce (*L. scariola*). Though its name signifies that it is more prickly than *virosa*, it is only so towards the base. In other respects it closely resembles *virosa*, but the branches are more erect, the points of the leaf-lobes more distinctly directed downwards, the flower-heads smaller. Flowers July and August. Very rare; recorded only from Worcester, Norfolk, Cambridge, Essex, Kent, and Surrey.

III. Least Lettuce (*L. saligna*). Much more slender, with fewer prickles. Branches of panicle so short that the inflorescence resembles a spike. Flowers July and August. Very rare; from Suffolk and Hunts to Sussex and Kent only.

IV. Alpine Lettuce (*L. alpina*). Not prickly, but velvety. Stem stout, succulent, unbranched (3 to 4 feet). Leaves broad at top, narrowing to flat, winged footstalks. Flower-heads 1 inch across, *blue*, in racemes. Flowers August, in hilly districts of Forfar and Aberdeen only.

Cross-leaved Heath (*Erica tetralix*).

The Cross-leaved Heath, though more widely distributed, is not so well known as the common Purple Heath (*Erica cinerea*) of our elevated moorlands and commons, for the latter is found in much greater communities. The Cross-leaved species may be known at a glance by its larger, pale-rose coloured, drooping flowers, which pale almost to white on their under-sides. The plant is downy, and the turned-under margins of the leaves are fringed with fine hairs. It is important to note as a further mark for identification that the leaves are arranged round the stem in whorls of *four*. The flowers are all drooping, and clustered in a dense head at the summit of the stem. Each



Cross-leaved Heath.

Erica tetralix.

ERICACEÆ.

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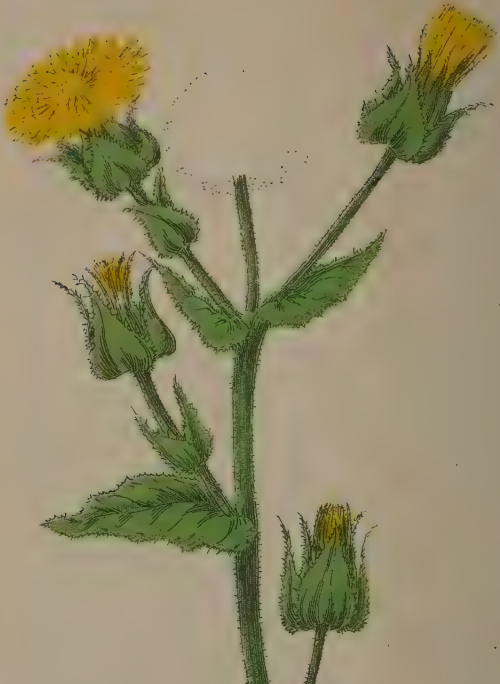


Bristly Ox-tongue.
Helminthia echioides.
COMPOSITÆ.

flower is egg-shaped, the corolla all in one piece, with four small lobes to its mouth. If we focus our pocket-lens on the interior through the mouth opening we get a rather striking view. In the centre stands the style, its stigmatic extremity partially blocking the mouth opening. Around it are the eight stamens, the anthers pressed into a compact ring and their tips touching the style. The anthers, instead of splitting along their sides or backs, as in many other flowers, open by small pores at the side, but as the sides of one anther are pressed closely to those of its neighbours the pollen cannot fall out without aid. From the broad end of each anther two curved processes stick out, and almost touch the walls of the corolla. Everybody who has kept or observed hive-bees knows that the Heaths supply them with a great deal of honey. But the honey is produced at that part of the corolla that is farthest removed from the entrance, and in order to reach it the bee's long tongue has got to feel its way among the sixteen projecting spokes from the ring of anthers. A little pressure upon one of them and it acts as a lever, breaking the anther-ring and exposing their pores, so that their pollen falls out and dusts the bee's face, and on its visit to another flower some of this is sure to be left on the sticky stigma. The Cross-leaved Heath flowers from July to September, and may be found in damp hollows and boggy spots on the heath, and in the moister parts of pine-woods. A sub-species—Mackay's Heath (*E. mackaii*)—is found in Co. Galway.

The other native species are :—

I. Fine-leaved or Purple Heath (*E. cinerea*). Distinguished from the foregoing species by its more slender reddish-purple flowers, and its smooth stems and leaves ; the latter exceedingly narrow, their edges curled under, and arranged around the stems in whorls of *three* leaves, with clusters of minute leaves in their axils. The flowers also are in whorls, and either horizontal or drooping. The sepals are four in number, green ; the corolla in one, egg-shaped, with four short lobes around the mouth. The stamens are eight, arranged much as in *E. tetralix*, bearing two-celled crested anthers, each cell opening at the side to discharge its pollen, and having a toothed process at its base : the cell-openings of one anther being pressed against those of neighbouring anthers. The style is dilated at the top, and its surface is the stigma. It flowers from July to September, and is the most characteristic plant of the moorlands in early autumn, tracts of many acres being continuously covered by it.

II. Fringed Heath (*E. ciliaris*) is a downy plant with many branches, and small oval leaves, arranged in whorls of three or four. The crimson flowers are egg-shaped, with a small one-sided mouth through which the style is protruded. The downy sepals have fringed margins. It flowers from June to September; but is restricted to sandy heaths in East and West Cornwall, and the neighbourhood of Wareham and Poole in Dorset.

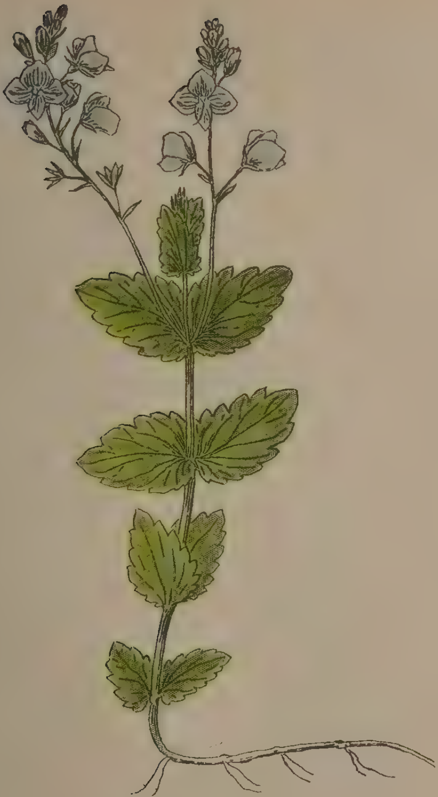
III. Cornish Heath (*E. vagans*) is a smooth plant with stout stems as much as 3 feet high, the erect branches densely covered with narrow leaves in whorls of three or four. The flowers do not droop as in most of the species, but grow erect in racemes. The pink corollas are not egg-shaped as in the others, but bell-shaped with an open mouth, through which hang the stamens and pistil. The stamens have not the tails as described in Cross-leaved Heath, but the filament of each forks and supports two separate anthers which are scoop-like in shape, opening at the tip. It occurs only in West Cornwall, and may be found on the heaths and downs near the Lizard, where it flowers in July and August.

IV. Irish Heath (*E. mediterranea*) is a tall, bushy plant, 4 or 5 feet high, with narrow leaves, usually four in a whorl, and racemes of pink flowers, which are tubular-bell-shaped, and appear in April and May. So far as the British Isles are concerned, this species occurs only in Mayo and Galway in Ireland, where it grows on boggy heaths.

The name *Erica* is the ancient Greek *Ereikh*, signifying heath or heather.

Bristly Ox-tongue (*Helminthia echioides*).

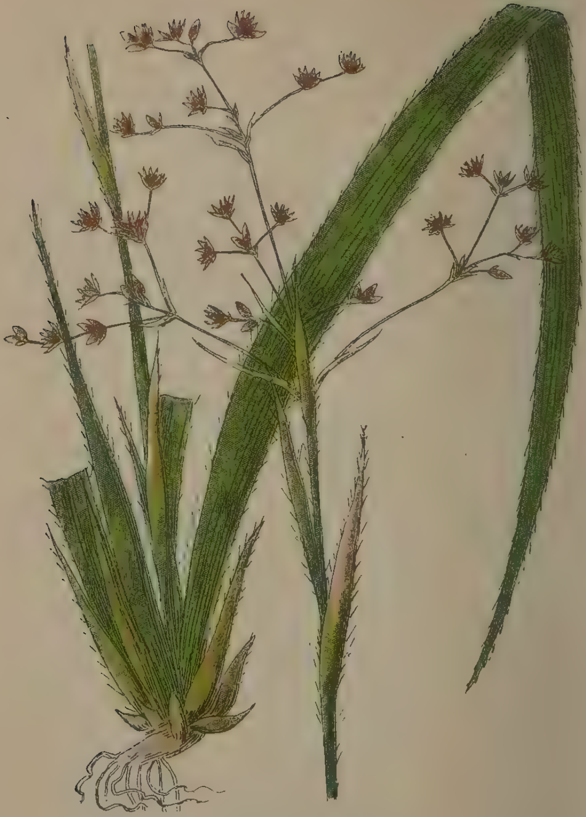
The Ox-tongue, though quite a common plant in rough wastes and by roadsides on stiff soils, is frequently passed by unnoticed, under the impression that its yellow flower-heads belong to the more familiar Sow-thistles. Like the Sow-thistles, it is full of a bitter, milky juice. The prefix Bristly in the name of this plant is well bestowed, for the plant is well covered with stiff hairs that branch into three minute hooks at their tips. These bristles spring from white swollen bases. The stout branched stems are 2 or 3 feet high. The broad, lance-shaped leaves from the root are stalked, but those on the stem are stalkless and heart-shaped. A very distinctive character is given to the composite flower-head by five broad heart-shaped involucral bracts, which cover up the ordinary scales of the half-globular involucre. All



Germander Speedwell.

Veronica chamædrys.

SCROPHULARIACEÆ.



Hairy Wood Rush.
Luzula vernalis.
JUNCACEÆ.

the florets of the flower-head are strap-shaped, as in Dandelion and Hawkweed, and of a yellow hue. The stems and outer involucral bracts are marked with purplish red. The flower-heads, which may be found from June to September, are succeeded by fluffy hemispheres of white pappus as in the case of Dandelion.

This is the only British species of the genus, which gets its name from the Greek *Helminthos*, a worm, in allusion to the slender curved brown fruit. By some authors it is included in the genus *Picris*, which otherwise consists of a single member—the Hawkweed Picris (*Picris hieracioides*), a bristly plant of similar habit, but the outer bracts of the flower-head are short and narrow, and covered with black hairs. It grows in similar places to those affected by the Bristly Ox-tongue, and flowers from June to October. *Picris* is the Greek *Pikros*, in allusion to the bitterness of the milky juice that flows from the plant when the stem is snapped.

Germander Speedwell (*Veronica chamædrys*).

The Germander Speedwell is the representative of a genus which includes sixteen native species, most of them with bright blue flowers of a particular form. The corolla is tubular for half its length, the upper portion divided into four spreading lobes, of which the upper and lower are usually longer than the lateral pair. The two stamens are attached within the corolla-tube just below the upper lobe, and the anthers and stigma protrude beyond the mouth of the tube. The seed-vessel is a two-celled, flattened, heart-shaped capsule. *V. chamædrys* shows to greatest advantage when it grows in a mass on a sloping bank, where, in May and June, its racemes of intensely bright blue flowers are very attractive. It is a most disappointing flower to gather, for the corollas readily drop off, and the beauty of the "button-hole" has rapidly passed.

It is a perennial plant with stems about 1 foot long, which at first creep and root, then ascend. The stalkless, opposite leaves are of oval form, with coarsely toothed edges. The racemes are usually in pairs. One of the names for the flower is Cat's-eye, and many continue to call it Forget-me-not. There has been a good deal of controversy at times as to the plant to which the romantic name belongs. Like several other of our folk-names, it has been applied to different plants in different localities, but until the early part of the nineteenth century *Veronica chamædrys* appears to have been generally meant when the name was used. In Germany and other European countries, however, *Myosotis palustris* was the Forget-me-not, and apparently by general consent it became so understood here, though the English name for that plant had been Water Mouse-ear Scorpion-grass.

There are sixteen native species in the genus, but several of these are of such rare occurrence that we need not describe them. The more generally distributed species are :—

I. Ivy-leaved Speedwell (*V. hederæfolia*). An annual found in fields and on banks, flowering from April to June. It has stalked leaves of a heart shape, with five or seven large tooth-like lobes. Flowers pale blue, solitary. Capsule swollen, with two seeds in each cell.

II. Field Speedwell (*V. agrestis*). An annual with prostrate stems and coarse-toothed, stalked, oval, heart-shaped leaves. Flowers solitary, small, blue, the lowest petal white ; sepals oval. April to September in fields and wastes. Capsule hairy ; about six seeds in each cell.

III. Buxbaum's Speedwell (*V. buxbaumii*). Annual, with prostrate stems and coarse-toothed, oval, heart-shaped leaves. Flowers as large as those of *V. chamædrys*, but solitary, blue with white centre ; March to September. Capsule sharply keeled, with about eight seeds in each cell.

IV. Wall Speedwell (*V. arvensis*). Annual, with ascending stems and heart-shaped leaves with rounded teeth—the lower leaves with stalks, the upper without and bract-like. Flowers small and pale blue with white centre, in a terminal raceme ; April to September. Sepals lance-shaped, unequal. Old walls and gravelly fields.

V. Thyme-leaved Speedwell (*V. serpyllifolia*). Perennial. Stems running along and rooting in the damp ground, then growing erect for a few inches. Leaves oval, very slightly round-toothed. Flowers in a long slender, terminal raceme, very pale blue with darker lines. Roadsides and damp ground, May to July.

VI. Common Speedwell (*V. officinalis*). Perennial. Stems hairy, lying along the ground, but branches ascending. Leaves more or less downy, with short stalks, oval, with a tendency to roundness, coarsely toothed. Flowers many, in racemes, pale blue or lilac; May to July, on banks and in pastures. All parts of the plant about half the dimensions of *V. chamædrys*.

VI. Mountain Speedwell (*V. montana*). Similar generally to *V. chamædrys*, but leaves much larger with long stalks, and flowers much smaller, paler, and in short racemes. Moist woods and thickets; June to September.

VIII. Marsh Speedwell (*V. scutellata*). Perennial. Stems smooth, slender, and brittle, at first lying along the ground, then half-erect. Leaves slender-lance-shaped, stalkless, and partially clasping the stem; faintly toothed. Flowers small (¼ inch), in numerous racemes; pale flesh-colour with darker lines; July and August, in bogs and ditches. This species sends off trailing runners from the rootstock.

IX. Water Speedwell (*V. anagallis*). Perennial, with a thick, fleshy, erect stem (3 feet), and broadly lance-shaped stalkless leaves, with distant teeth. Flowers small, pale lilac or pale blue in long racemes; July and August. The stem is hollow, and from its base rooting runners are given off. Ponds, streams, etc.

X. Brooklime (*V. beccabunga*). Perennial. Stems lying partly on the mud and rooting; stout and hollow, with spreading branches, and thick smooth oblong stalked leaves. Flowers in racemes, small, bright blue, occasionally pink; May to September in ditches and brooks.

Hairy Wood-rush (*Luzula vernalis*).

The Rushes as a whole (*Juncus* and *Luzula*) form a group of plants that is generally despised, except for weaving into mats, and, in former days, for providing wicks for rush-lights. We have in the one genus cylindric, in the other flattened, grass-like leaves, and inconspicuous flowers of green or brown; and yet the evolutionists tell us on the evidence of those flowers that the rushes are descendants of a noble family—the lilies—who have in the struggle for existence taken to a less showy *rôle* in life, in order that they might be included in the list of the surviving "fittest." The truth of this will be apparent if we take the flower of a present-day lily—a Tulip or a Tiger-lily will do—and compare it with this Hairy Wood-rush. We shall find every part of the lily reproduced in the rush-flower on a small scale, with the greatest economy of materials.

The Wood-rushes (*Luzula*) are all perennial plants. Their leaves are like the blades of short grass, the edges fringed with long white silky hairs. The floral leaves (*perianth*) are six in number, in two series, and are chaffy in texture. Stamens six. The ovary is broad, narrowing to the summit, upon which is the style, ending in three long stigmas covered with minute raised points. The fruit is a one-celled, three-valved capsule, containing three seeds at the bottom. In *L. vernalis* the flowers are chestnut brown, with the perianth segments shorter than the blunt-topped capsule, and pointed at the tips ; clustered in twos and threes and grouped in lax cymes. The radical leaves are broad (¼ inch), soft, and sparingly hairy. It grows in woods and shady places, flowering from March to May. The other members of the genus are :—

I. Great Hairy Wood-rush (*L. maxima*), a much larger plant, the leaves sometimes ½ inch broad and 1 foot long, sparsely hairy. Flowers paler, three or four clustered ; cymes large, compound. Woods and heaths. May and June.

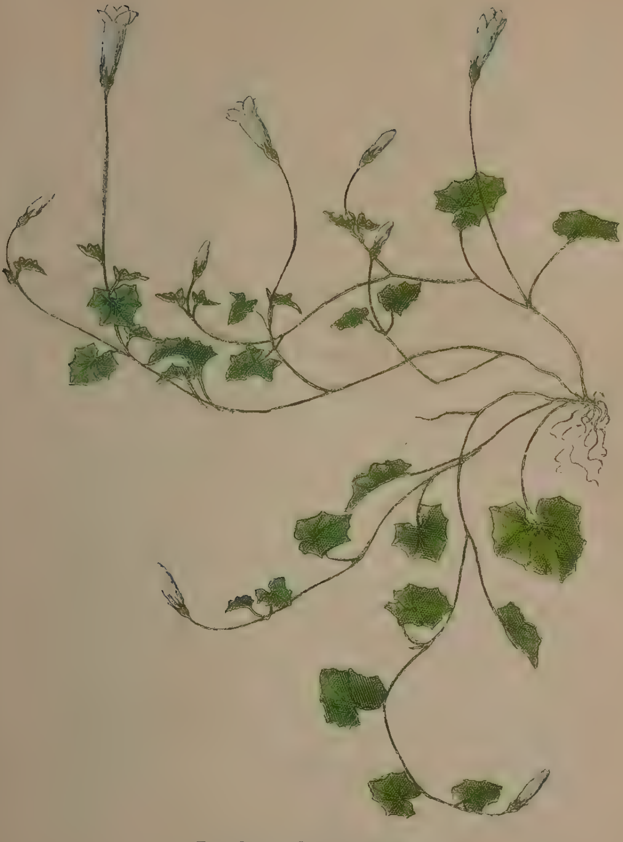
II. Narrow-leaved Wood-rush (*L. forsteri*). Similar to *L. vernalis*, but more slender and taller. Capsule pointed. Shady places on chalk or gravel, not farther north than South Wales and Oxford. April to June.

III. Field Wood-rush (*L. campestris*). Rootstock creeping. Leaves very hairy. Perianth segments longer than the broad rounded and spiked capsule. Flowers in dense clusters of three or four, in short cymes. Heaths and pastures. April to June.

IV. Spiked Mountain Wood-rush (*L. spicata*). This and the next are purely mountain species, restricted to an altitude of 1000 to over 4000 feet for *spicata*, and from 3000 to over 4000 for *arcuata*. The leaves are narrow, leathery, and the hairiness is confined to the lower end. Flowers smaller than the silvery, chaffy, awned scales (*bracteoles*) below them. The perianth segments end in awns, and are longer than the abruptly-pointed capsule. The cymes are densely flowered, drooping and spike-like. Flowers in July.

V. Curved Mountain Wood-rush (*L. arcuata*). The smallest, rarest, and most distinct of our native species. The stems do not exceed about 4 inches, and are proportionately stout. Rootstock creeping. Leaves short, narrow, leathery, slightly hairy. Flowers dark brown, three to five in a cluster, in lax cymes ; the perianth segments extended to a point. Bracteoles pointed, not awned, not silvery. Mountains in Scotland only. July.

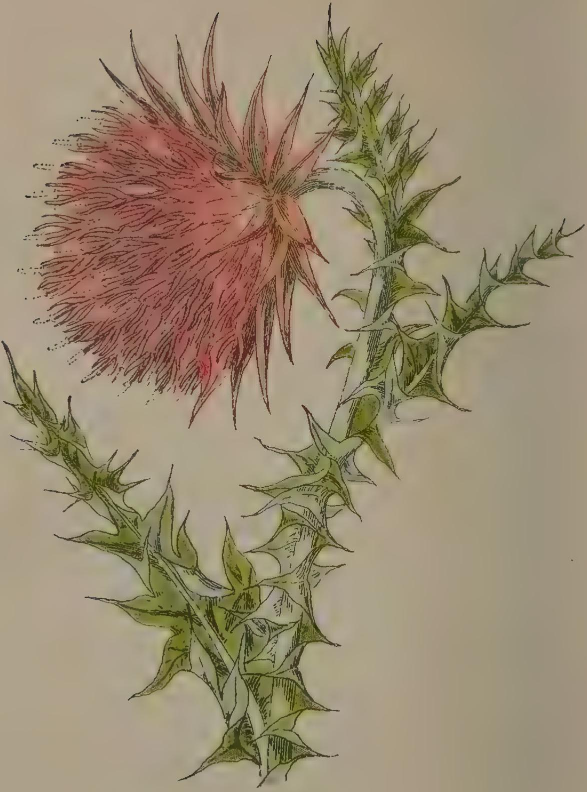
The name *Luzu'a* is from the Latin *luciola*, a glow-worm.



Ivy-leaved Bellflower.
Wahlenbergia hederacea.
CAMPANULACEÆ.

2 *Pl.* 8

B 10



Musk Thistle.
Carduus nutans.
COMPOSITÆ.

Ivy-leaved Bellflower (*Wahlenbergia hederacea*).

Among the beauties of bogland, this extremely delicate plant deserves more prominence that its physical dimensions confer. Radiating from a small creeping rootstock, its trailing stems are mere threads. Its neat little five-pointed and pale green leaves but slightly exceed half an inch at their fullest development. They are more nearly ivy-shaped than those of the Ivy-leaved Toad-flax (page 84), but like it have a heart-shaped base. The leaf-stalk is rather long, thicker at its junction with the leaf then at its lower extremity. The flowers are solitary, borne high and erectly above the leaves on long footstalks, and starting off from the stem opposite to a leaf. There is a top-shaped calyx with five triangular lobes, which do not turn outwards but clasp the base of the tubular corolla. This is of a delicate pale blue tint, and its length (half an inch) is just twice its width at the mouth, which has five blunt-pointed lobes that turn slightly outwards. The plant is a perennial, and is in flower during July and August. Its seed capsule is of rounder form than that of any true bell-flower (*Campanula*, see pp. 21, 47), and instead of opening below the calyx, as in *Campanula*, this opens within the calyx. This is the character upon which it has been separated from the other bellflowers, among which it was formerly included.

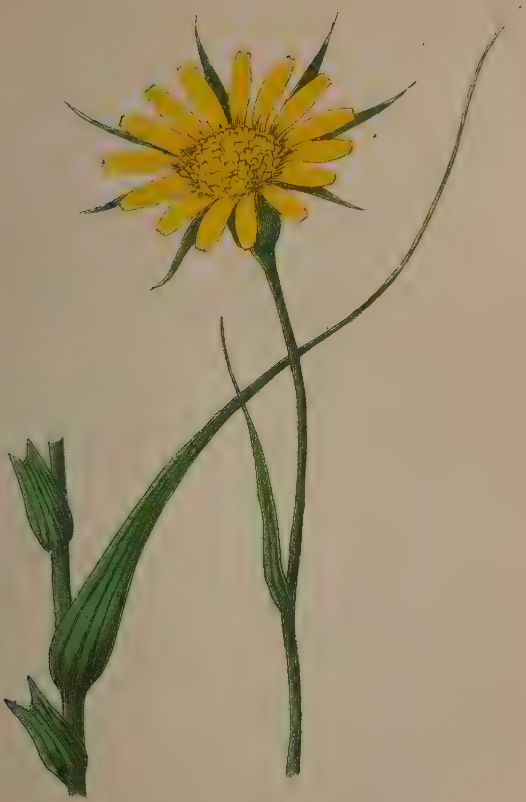
It is not confined to bogs, as it may sometimes be found among grass in the wetter parts of woods where there is peaty soil. It is by no means a common plant in this country; and beyond, it is only known in France and Spain. In England its southern distribution is from Kent to Cornwall, and this is continued through the western counties as far north as Yorkshire. Beyond this there is a gap extending to Ayrshire, where the plant reappears and continues to Argyllshire. It is found in the south and east of Ireland; also in the Channel Islands. It is the only British representative of the genus, which has many species in tropical and temperate regions. An alternative name sometimes used for it is *Cervicina hederacea.*

Wahlenberg (1780–1851), whose name has been adapted for that of the genus, was Professor of Botany in the University of Upsala, and the author of several important botanical works. *Hederacea* is from the Latin name of the Ivy.

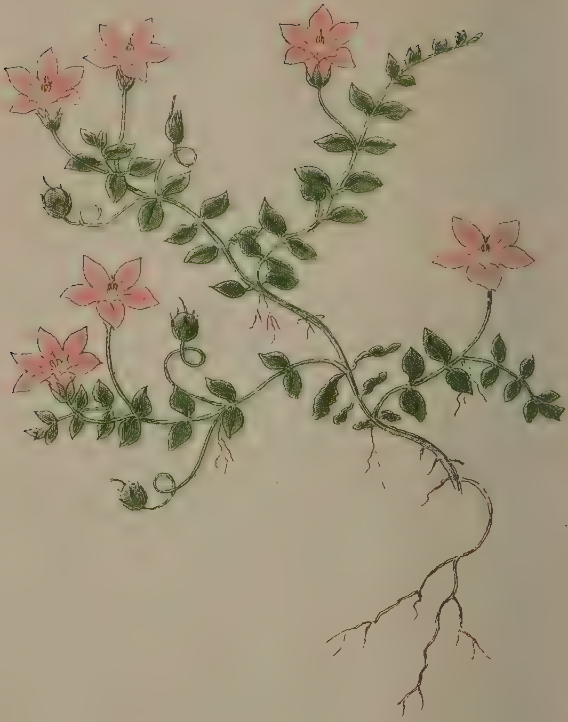
Musk Thistle (*Carduus nutans*).

Thistles of the genus *Carduus* are annuals or biennials, and are therefore more under the control of the agriculturist than are the perennial species, like *Cnicus arvensis*, that creep extensively under his permanent pasture, and laugh at his futile efforts at extermination with a sickle. But then, again, it so happens that the three British thistles included in this genus do not trouble the farmer much, having less fondness for fields than for exposed moorland wastes and sheltered hollows of the rolling chalk-downs. We have in our mind's eye such a hollow in the North Downs, that is in July one of the most brilliant wild gardens of Nature's own planning that one could hope to see. There are long yellow spikes of Wild Mignonette, and richer golden ones of Agrimony, airy sprays of Dropwort, bright blue Chicory, and many other lowly plants, whilst towering high above them in the shade of the straight beeches are the bold glaucous foliage and lavender flowers of the Opium Poppy, and the equally bold but darker leaves and large crimson flower-heads of the Musk Thistle.

It is the prevailing habit of the Musk Thistle to grow erectly, without a branch, to a height that varies from 2 to 5 feet ; its stem grooved, winged, and spiny, a condition which is helped by the leaves extending partially down it, and investing it with their long spears. Wings interrupted. The large flower-head—the largest among our native thistles—hangs on its curved stalk in a drooping manner that has suggested its name of *nutans.*



Goat's Beard.
Tragopogon pratensis.
Compositæ.



Bog Pimpernel.
Anagallis tenella.
PRIMULACEÆ.

It is a fine object even before its flowers open, for the prickly bracts of the involucre are covered with a regular mesh of webbing, as though some industrious spider had been working upon it. When the flowers open, the bright crimson heads measure 2 inches or more across, and give out an agreeable scent which has been compared to musk. It flowers from June till the end of September. The other species are :—

I. Welted Thistle (*C. crispus*). With small heads in clusters. Stem 1 to 3 feet, branched, cottony. Wings continuous. Leaves lobed, cottony beneath. Flowers purple or white ; June to August, in hedgerows and wastes.

II. Slender-flowered Thistle (*C. pycnocephalus*). Stem 1 to 4 feet, with continuous wings, branched, hoary. Leaves with broad, toothed lobes. Bracts of involucre few ; spines turned back. Flower-heads small, in clusters. Flowers pale purple ; June to August. Sandy wastes, especially near coast towns.

Goat's Beard (*Tragopogon pratensis*).

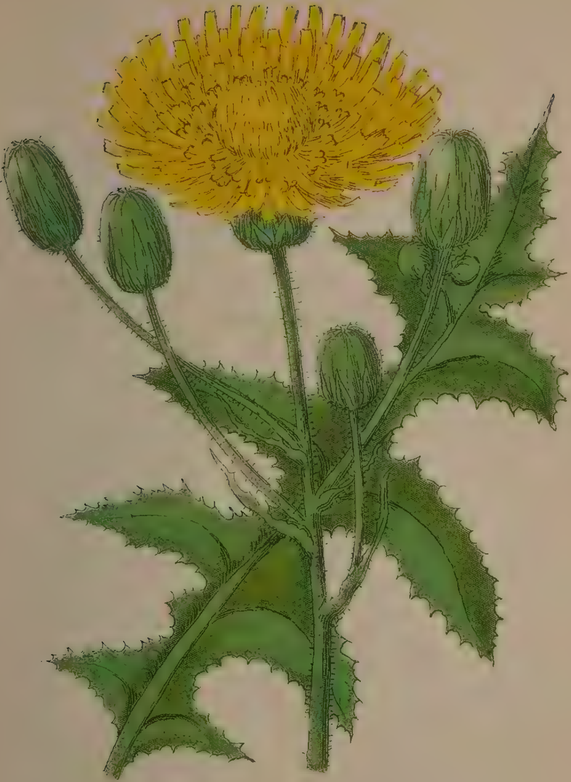
One of the folk-names of this plant is "John-go to-bed-at-Noon," which is one of the few examples of a British plant-name that is a sentence of six words. "Three-faces-under-a-hood" runs it pretty closely, but the few names we have of this order do not usually exceed four words ; such as Queen-of-the-Meadows, Jack-by-the-hedge, and Poor-man's-weatherglass. Mr. James Britten, F.L.S., reminds me ("Nature Notes," vol. vi. p. 132) that in north-west Lincolnshire the pansy is called "Meet-her-i'-th'-entry-kiss-her-i'-th'-buttery," which leaves this plant in the second rank. John-go-to-bed, etc., is a nice expressive name, and is due to the fact that the flower is an inveterate early-closer. It is probably the originator of the eight-hours' day, for it opens about four in the morning and is closed by twelve. Farmers' boys were said of old to consult its flowers with reference to dinner-time, but probably in these days of cheap machine-made watches the practice is obsolete. And it is well that it should be so, for the Goat's Beard that has been fertilized early in the morning closes much before noon.

Goat's Beard has a tap-root, somewhat like a parsnip, and long, curling, grass-like, stalkless leaves that clasp the stem by their bases. The flower-heads are solitary, yellow, and the eight involucral bracts are united at the base. All the florets (like those of Dandelion, Sow-thistle, and Chicory) are rayed, and contain both stamens and pistil. They are invested with pappus hairs, which are stiff and feathered. It is from these *beards* the plant gets its English name, which is reproduced in the Greek words from which the name of the genus is composed, *tragos*, a goat, and *pogon*, a beard. The typical form of the species is seldom found in this country; in this form the involucral bracts scarcely exceed the rays in length. In the var. *minor*, which is the form usually seen here, the heads are smaller and the involucral bracts are twice their length. Our illustration shows this form. It flowers during June and July, and is fairly common in meadows and wastes in England; much more rarely in Scotland and Ireland.

There is an introduced species with larger purple or rose-coloured flowers, found occasionally in damp meadows. This is the Salsify (*Tragopogon porrifolius*). It is occasionally grown for the sake of its roots, which have a medicinal value, but inferior to those of Scorzonera, which it somewhat resembles.

Bog Pimpernel (*Anagallis tenella*).

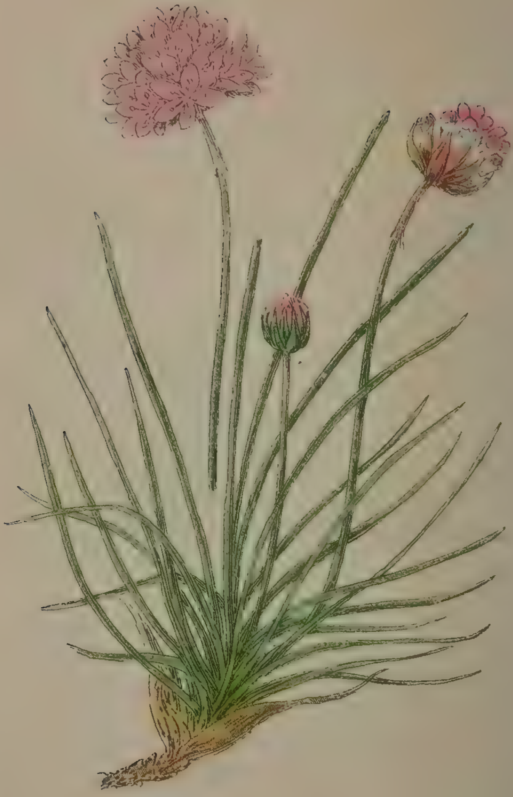
The flower-lover who is not too particular on the subject of damp shoes finds abundant reward when he wanders round a marsh or bog. There grow many of our most beautiful and interesting plants, and among the former must certainly be included the Bog Pimpernel. Everybody who knows anything of our wild flowers—even in the most restricted sense—is acquainted with the Scarlet Pimpernel or Poor Man's Weather-glass (*see* page 40) that grows in every field. But though the



Corn Sow-thistle.
Sonchus arvensis
COMPOSITÆ

2 *Pl.* 12

B 14



Sea Pink.
Statice armeria.
Plumbaginaceæ.

2 Pl 13

B 15

Bog Pimpernel, its near relation, is almost as widely distributed in these islands, it is safe to say that not one in twenty of those who know the scarlet flowered species have ever seen the rosy one. The sole reason for this difference lies in the respective habitats of the two plants, and most bog plants are similarly unknown to many persons who rather pride themselves upon their acquaintance with our native flora. The reader of this book, we are sure, will take our word for it that the edge of the bog is a safe and charming place, for there he must go if he would make acquaintance with this exquisite plant.

Like its scarlet relation, the Bog Pimpernel has creeping stems, but *A. arvensis* is of comparatively rank growth compared with this. The stems root in the moist ground and Bog-moss, and the pale leaves are broad-oval, slightly stalked, and much more numerous, whilst the rosy flowers are proportionately much larger, and funnel-shaped. They are mounted on long stalks, and the petals greatly exceed the calyx in length. The stamens, which are all distinct in the scarlet species, here have their filaments united below. It is a perennial plant, and may be sought in flower during July and August.

Anagallis is the old Greek name, and is made up of *ana*, again, and *agallo*, to adorn.

Corn Sow-thistle (*Sonchus arvensis*).

We were nearly remarking that the Sow-thistle is one of the most beautiful of our native flowers, but remembering that we have already applied that observation to several species, we will alter the formula and say it is among the most handsome. Certainly no one who sees it growing is likely to pass it by without plucking some of the flowers, though they will be disappointed in these flagging and losing their beauty before home is reached. We have three native species, of which this is undoubtedly the finest, the unbranched stem growing to a height of 3 or 4 (or, as we have found it in moist ground, over 5) feet. It is a perennial, with a large creeping rootstock, which sends off runners. The stem is hollow, milky, and clasped by the bases of the finely cut leaves. These are deeply lobed, and edged with sharp teeth ; the lower leaves have stalks, the upper have not. The unopened involucre is very broad at the base, and covered all over—as are the stems also—with short hairs with glandular ends of a golden yellow. In the var. *glabrescens* the glandular hairs are absent. The expanded flower-head is about 2 inches across, and is composed entirely of ray-florets. The plant will be found flowering in or around cultivated fields and waste places in August and September. The other British species are :—

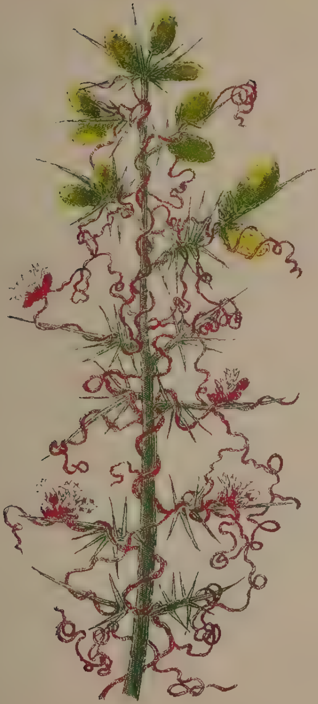
I. Marsh Sow-thistle (*S. palustris*), now all but extinct, and found only rarely in the Eastern counties of England, and in Kent. It is taller-growing than *arvensis*, the stem sometimes reaching 9 feet, but the flowers are only half the size of that species.

II. Common Sow-thistle (*S. oleraceus*). A common annual in every field and waste. General character of plant very similar to *arvensis*, but smaller. Stem branching, 2 to 3 feet in height, without (or rarely with) the glandular hairs. Leaves clasping the stem, with arrow-shaped ears at base. Flower-heads many, not exceeding 1 inch in diameter. June to September. The sub-species, *Sonchus asper*, has the leaves with crisped margins, which give it a closer resemblance to a thistle.

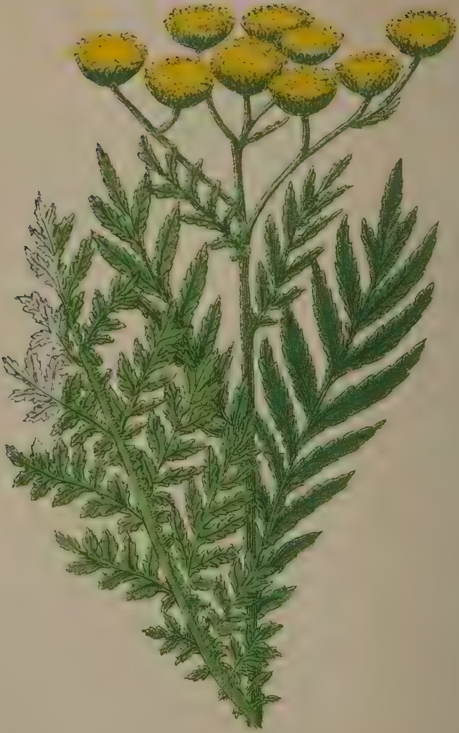
Name supposed to be derived from the Greek, *sonthos*, hollow, in reference to the fistular stems.

Thrift or Sea-pink (*Statice maritima*).

In old-fashioned gardens the Thrift may frequently be seen forming a compact edging to beds and borders. Probably few of those who thus grow it are aware that its natural habitat is on the rocks and cliffs of the seashore, or the rocky sides of high mountains. It is in such situations, even to the altitude of nearly 4000 feet, that the rambler will meet this charming flower. As we pen this description, the rocks right down to high-water mark, the cliffs above, and the stone-faced hedges of the fields still higher are brilliant with the long-stalked,



Lesser Dodder.
Cuscuta epithymum.
CONVOLVULACEÆ.



Tansy.
Tanacetum vulgare.
COMPOSITÆ.

pale rosy heads of flowers rising from the bright green cushions of grass-like leaves. Also known as *Armeria vulgaris*.

The rootstock is long, thick, woody, and much branched. Every branch ends in a bundle of leaves that are truly linear, being about $\frac{1}{20}$ inch in breadth, and usually about 4 inches long. From the centre of this leaf-bundle rises the smooth, softly hairy flower stem, 6 to 9 inches long, ending in a silvery bud or a half-round bunch of flowers, with its involucre of thin, tough scales. The lowest of these scales are prolonged downwards to form a purplish sheath, $\frac{1}{2}$ inch long, round the stalk. The individual flowers are separately stalked, and may be separated easily from the cluster. They will be found to consist of a five-lobed, funnel-shaped calyx, of similar character (*scarious*) to the involucre, and a corolla of five clawed petals. There are five yellow anthers, and the ovary bears five long, thread-like stigmas. The flowers have much of the "everlasting" texture, and their form remains long after the colour has been bleached out. The central flower in each head opens first, and the stamens mature before the stigmas. The heads are sent up in succession from April to October.

There is one other native species :—

Plaintain-leaved Sea-pink (*S. plantaginea*), but it is found only in Jersey. It has much broader leaves, and is generally a stiffer, stouter plant, with darker flowers. June to August.

Lesser Dodder (*Cuscuta epithymum*).

There are at least two Dodders indigenous to this country, and we have the misfortune to have introduced a third with flaxseed from abroad. The one figured is the Lesser Dodder, which is usually found clinging in a tangle round the stems of furze, and small shrubs, such as thyme and heather. This close embrace is sinister in character, for, as may be guessed from the entire absence of leaves and green-colouring matter, the plant is a parasite. Its stem is a mere thread, of a crimson hue, and having at frequent intervals bunches of red and white flowers—that is to say, the calyx is red, the corolla white. These are very small, but if separated will be found to consist of a four- or five-parted calyx, a persistent pitcher-shaped corolla with a corresponding number of lobes, and stamens to match. The two styles protrude from the mouth of the corolla. It flowers from July to September. The other species are :—

I. Greater Dodder (*C. europæa*), with stouter branching stems varying from red to yellow in colour. The flowers are yellowish, and their styles do not protrude ; they appear in August and September. This species is not found north of Yorkshire, and is everywhere rare. On nettles and hedges.

II. Clover Dodder (*C. trifolii*) is by some considered only a variety of Lesser Dodder which almost confines its attentions to the Clover plant ; but others regard it as a distinct species. It has a slender branching stem, of reddish-yellow colour, forming dense circular patches. Flowers white, with red tips to the sepals ; July to September.

III. Flax Dodder (*C. epilinum*) is the alien referred to as introduced from the Continent. and seriously injuring Flax crops. The stems in this species are pale green, and but slightly branched. The flowers are pink in small clusters.

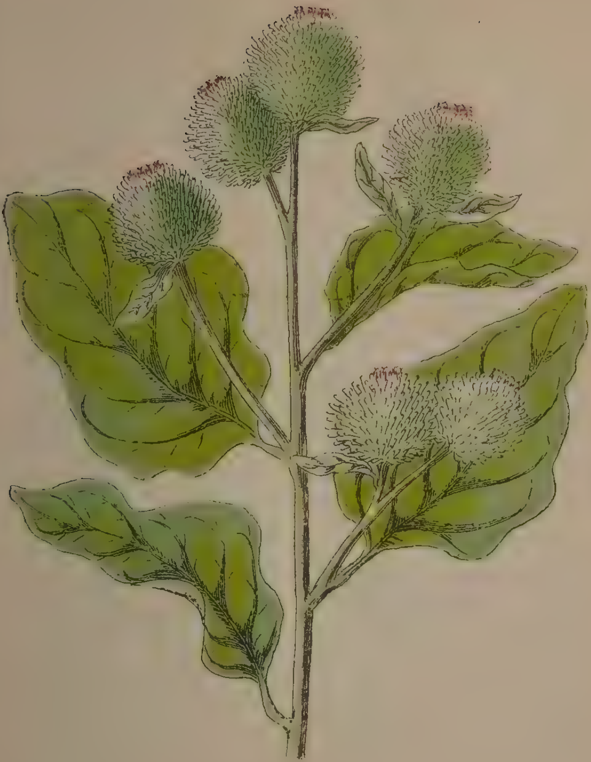
Other introduced species occasionally found in this country are *C. approximata* on Bokhara Clover, and *C. hassiaca* on Lucerne. All the species named are annuals.

Owing to the serious nature of the attacks of *C. epilinum* upon our flax-crops, Professor Buckman was induced years ago to experiment, with the object of elucidating its mode of growth. He found that seeds of Dodder sown strictly apart from any host-plants germinated in four days, and on the sixth a thread-like plant was seeking a foster-parent, but by the eighth, not having succeeded in its object, it died. Others were sown in company with flax-seed, and in a few days the young Dodders attached themselves to the young flax-plants, made one or two tight coils round the victims, whose growth soon lifted the Dodders right out of the soil, and thereupon the parasites sent aerial roots into the flax, and their natural roots dwindled and perished. Thereafter its true parasitical growth is most rapid, to the detriment of the foster-plant.

The genus is included in the Natural Order Convolvulaceæ.

Common Tansy (*Tanacetum vulgare*).

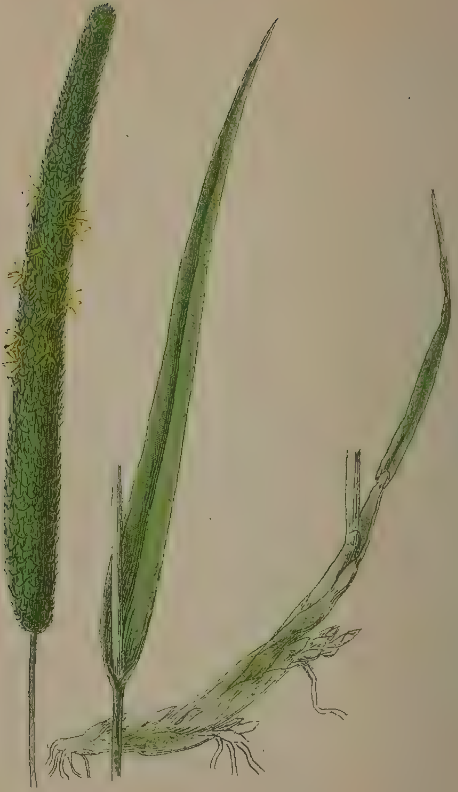
Time was when every cottage garden and every kitchen garden had its clump of Tansy, for it was a valued item in the housewife's pharmacopœia, and was all but invaluable in



Burdock.
Arctium lappa.
COMPOSITÆ.

2 *Pl.* 16

C 18



Cat's-tail or Timothy Grass.
Phleum pratense.
GRAMINEÆ.

cookery, especially so in spring. Puddings, cakes, and omelettes were contrived with Tansy as the principal ingredient. Having read this, try to chew half a leaf of Tansy, and you will realize what a revolutionary change in taste has come about in the last two centuries. A belief is entertained by some botanists that the Tansy-plants growing wild in waste places by field and roadside throughout the country are garden escapes, or their descendants, that have become naturalized.

The Tansy is a perennial, with a creeping rootstock, from which arise beautiful broad feathery radical leaves and flowering stems. The leaves are very deeply divided in a pinnate or bi-pinnate manner, the segments toothed. The angled stem reaches a height of 2 or 3 feet, and then branches off into a *corymb* of flower-heads. Each flower-head is enclosed in a half-rounded involucre of leathery bracts. There is an outer row of ray-florets, but they are very short, and of the same golden yellow colour as the disc-florets; they are pistillate only, whilst the disc florets are all staminate. Flowers from July to September.

All parts of the plant give off a strong aromatic scent when touched or handled, and the taste is exceedingly bitter, a quality which caused it to be used as a stomachic tonic and a vermifuge.

This is the only British species of the genus, whose name is said to be a corruption of *Athanasia*, deathless ; but probably it is not so derived.

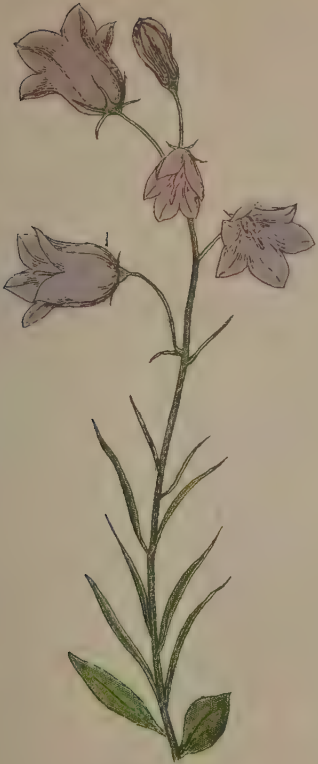
Burdock (*Arctium lappa*).

The Burdock is a plant well-known to artists and boys ; the former being interested in it as a fine foreground plant, the latter on account of its hooked bracts, which make the fruit-head an admirable instrument of torture, or an ornament for decorating some other person's clothes. In its young state the plant is suggestive of the Butterbur, the fine bold lower leaves having a densely cottony underside as in that plant. But there the similarity ends, for in Butterbur there is no rising stem, whereas in Burdock this ordinarily reaches a stature of 3 or 4 feet. Occasionally, in out-of-the-way corners, it may be found to have reached the height of 6 or 7 feet. The stem is stout, the leaves alternate, heart-shaped, thick. The flowers are in dense heads, like a thistle, but without any spreading rays. The involucre is globose, of many leathery bracts, each ending in a long stiff hook, by means of which the ripe heads become firmly attached to the coats of animals, and the seeds are thus carried far and wide. The corolla is five-lobed, purple. It is common in all waste places, and flowers from June to September. According to Hooker this is the only British species, but the "splitters" have made four or more species out of it.

The name is from the Greek, *Arktos*, a bear, from its rough appearance.

Cat's-tail or Timothy-grass (*Phleum pratense*).

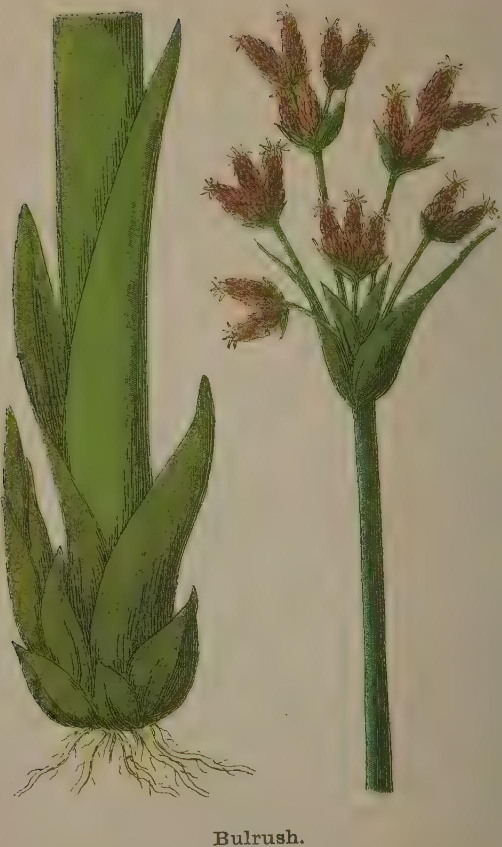
Timothy is one of the most valuable of our grasses, and forms an important portion of the hay crop, from the fact that it is one of the earliest and most abundant species. The stems are slightly creeping before they rise, and are sometimes tuberous. The inflorescence is a crowded spike-like panicle, reminding one somewhat of a miniature reproduction of the Reed-mace (*Typha*). The spikelets are one-flowered. The outer glumes are boat-shaped, with a long awn and stout green keel, fringed with stiff hairs. The flowering glume is glassy, and entirely included within the outer ones, from which, however, the long stamens and feathery stigmas protrude. The anthers are yellow and purple. The plant is perennial, and flowers from June to September. The name *Phleum* is from the classic



Harebell.
Campanula rotundifolia.
CAMPANULACEÆ.

2 *Pl.* 18

C 20



Bulrush.
Scirpus lacustris.
CYPERACEÆ.

2 *Pl.* 19

C 21

Greek (*Phleos*) for the plant. The figure represents the panicle after most of the anthers have passed their prime ; at an earlier period these stand out well from the glumes, and give a very light appearance to the spike. There are three other native species, but they are all more or less local :—

I. Purple-stalked Cat's-tail (*P. phleoides*) has a cylindrical panicle, with narrow lance-shaped glumes, ending in a hard point. Stem nearly leafless above. A rare plant of chalky soils. July.

II. Seaside Cat's-tail (*P. arenarium*). Panicle oblong, stouter above than below. Glumes lance-shaped, tapering to a sharp point ; keel fringed above. Anthers very small. June and July on sandy soils, chiefly near the sea.

III Alpine Cat's-tail (*P. alpinum*). Rootstock creeping ; leaf-sheaths inflated ; panicle egg-shaped, bristly. Glumes ending in a long rough awn ; keel fringed. July, on wet alpine moors in Perthshire, Forfarshire, and Aberdeenshire.

I. and II. are annuals ; III. is perennial.

Harebell (*Campanula rotundifolia*).

This is the true Blue-bell of Scotland, but the Blue-bell of the Southron is the Wild Hyacinth. Scotsmen are very sensitive upon the point of the Hyacinth having so dear a name bestowed upon it, when it has already a sufficiently good and classical one, and there are few, if any, more certain ways of rousing a Scot than by exhibiting *Scilla* as the *true* Blue-bell, or by describing *Campanula* as the Harebell. Others have found the plant a fruitful source of controversy on a philological point —should it be spelled Hairbell or Harebell ?—does its name refer to the slender hair-like stems, or to its habit of growing where hares delight to revel ? According to Latham it should not be spelled Hair- or Hare-, but Ha'erbell, for it is a contraction of Heatherbell.

There are eight species of *Campanula* included in the British flora, of which three are rare, and have probably escaped from cultivation. *The* characteristic of them all is a beautiful bell-shaped corolla with five lobes, five stamens, and the style with three to five stigmas. They are mostly perennial, and the flowers most frequently blue. *C. rotundifolia* has a creeping rootstock, and several slender, angled stems. The first formed leaves, near the ground, are more or less rotund (heart-shaped, or kidney-shaped), and stalked, but as they occur higher up the stem they are more and more slender. The flowers are nodding or drooping, and swayed by the breeze. Heaths and pastures. July to September.

I. Rampion (*C. rapunculus*). A rare perennial with a rough angular stem 3 feet high. The lower leaves are broad lance-shaped, stalked; upper ones much narrower. The small pale blue flowers are grouped in a loose panicle, and are more or less erect; the divisions of the calyx awl-shaped. Root turnip-shaped; edible. July and August on sandy soil from Fifeshire southwards.

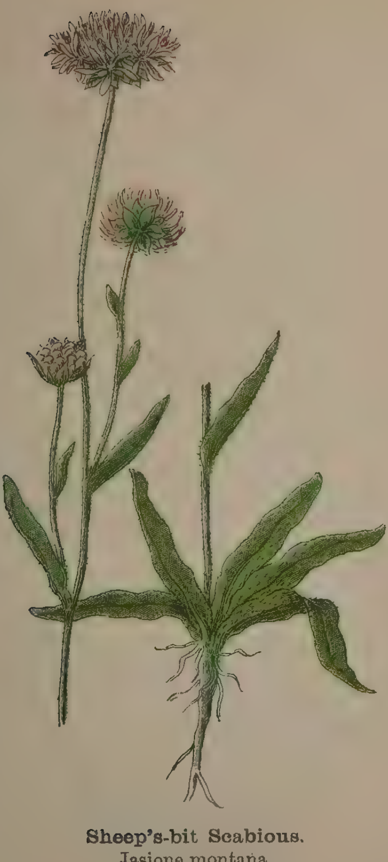
II. Spreading Bell-flower (*C. patula*). Biennial, or perennial; 2 feet high. Radical leaves oblong, stalked; stem-leaves narrow-lance-shaped. Flowers few, panicled, on long stalks, erect; the lobes of the corolla widely spread, so that it is funnel-shaped rather than bell-shaped, and it is more purple than blue. It flowers in July and August, and affects hedges and thickets, chiefly in the western and southern counties, not extending farther north than Yorkshire.

Other species will be found under Nettle-leaved Bell-flower (page 47), with which they have closer affinity.

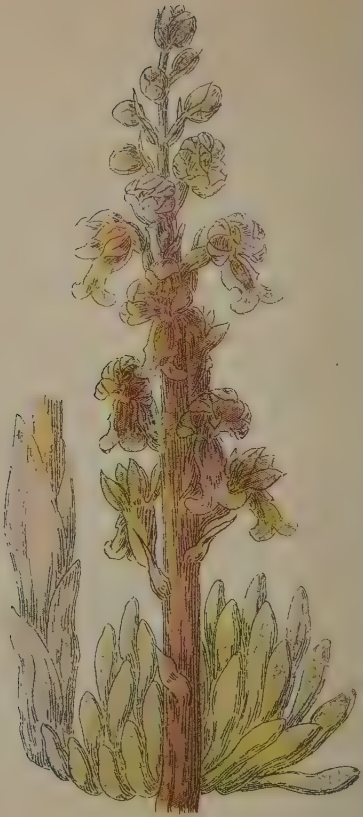
The name of the genus is from the Latin *campana*, a bell.

Bulrush (*Scirpus lacustris*).

We have elsewhere referred (*see* Great Reed Mace) to the general mistake that is made by the British public in calling the Great Reed Mace (*Typha latifolia*) by the name of Bulrush, and to the similar blunder made by King James' Bible-translators, who got into a complete muddle over it. The Hebrew words which they rendered "Bulrush" are two, *gome* and *agmon*, and modern Hebrew scholars declare these to be philologically identical, and to refer to the Paper-reed (*Cyperus papyrus*); but the translators variously rendered these words as "hook," "cauldron," "rush," and "bulrush." Our English name Bulrush is said to have been originally Poolrush, but by a process well known to philologists the *p* was turned into *b*, and as "boolrush" conveyed no meaning, the "ool" was changed into "ull"



Sheep's-bit Scabious.
Jasione montana.
CAMPANULACEÆ.



Bird's-nest Orchis.
Neottia nidus-avis.
ORCHIDACEÆ.

2 *Pl.* 21

C 23

to identify it with the cow's mate; finally the second *l* was dropped as being redundant. And there we are; but there is no reason why we should continue the process, and shift the name altogether to a species in no way resembling it, and one that is not even a rush.

The Bulrush is allied to the Cotton-grass and the Sedges. It is not usually a very leafy plant; in fact, its thick, spongy stems are in most cases leafless. When the leaves occur they vary according to situation, whether the plant is growing in a pool or in a river; if in still water they are short and flat, with a keel; in flowing water they are much longer and strap-like. The stems are nearly an inch in diameter, and as much as 8 feet in height, round, sheathed at the base. The flowers are in clustered cymes, with stout, straight branches, each bearing a cluster of two to six cylindrical spikelets of a red-brown colour. The glumes are arranged to overlap one another round a central stalk; they are two-lobed with a little awn, fringed with fine hairs, and, with the exception of the two lowest, which are empty, they each contain three stamens and an ovary, with a twice or thrice-cleft style. The perianth is represented by four or six bristles. July and August are the flowering months. There are a dozen other British species, but none calculated to be confused with the Bulrush.

The name *Scirpus* is Latin, and the same as that used by the ancient Romans for a Rush.

Sheep's-bit Scabious (*Jasione montana*).

Although very different in colour, the flower-heads of Sheep's-bit are very liable to be passed by as pale forms of the Devil's-bit Scabious (*Scabiosa succisa*). Their habitats are very different, and there is no relationship, but the fact that they produce blue heads of flowers of similar size is sufficient for many persons. Popularly both Sheep's-bit and Devil's-bit are considered as Composite flowers, whereas the first is one of the Bellflower family, and the second belongs to the Teasel family.

Sheep's-bit Scabious is a lover of light dry soils, and if between June and September we wander over the heath or down we may find its bright blue hemispheres nodding on their long flexible stalks. Several rough stems diverge from the rootstock and attain a height of about a foot, each branch ending in a hemispherical head of lilac-blue flowers. There is a rosette of stalked oblong leaves at the base, whilst those from the stem are much narrower and stalkless. The corolla is wheel-shaped, but split to the base into five slender lobes. The small, half-round capsule opens at the top to distribute the minute seeds.

This is the only British species.

Bird's-nest Orchis (*Neottia nidus-avis*).

There are nearly forty British species of Orchidaceæ. In the space at our disposal it is impossible to give anything like an adequate account of the group or of the specific characters. An attempt will be made, however, to make the reader acquainted with the general structure by means of figures of seven representative species. The first of these is the Bird's-nest Orchis (*Neottia nidus-avis*), but as it can hardly be taken as a type of the family we will preface our description of it by a few general remarks.

The Orchidaceæ includes sixteen British genera, but no fewer than nine of these are monotypic—have only one native representative. All the species are herbs with fleshy roots, some of them taking the form of tubers, and three of them are brown and leafless, getting their nutriment entirely from dead leaves (*saprophytes*). Where leaves are present they are mostly strap-shaped, their bases wrapping round the stem, but in the

Tway-blade they are large ovals, ½ foot long, and distinctly ribbed. The flowers are arranged along the upper part of the stem in spikes or racemes. As the sepals are generally large and coloured, and play the part that is usually reserved for petals alone, the calyx and corolla are spoken of collectively as the *perianth*, which is six-parted (three sepals, three petals). The sepals are nearly alike, but the upper of the three petals is usually larger than the lateral pair, and of different shape. It is known as the lip, and often ends behind in a hollow spur. The stamens and the style are united to form an irregular body known as the *column*. There is only one anther, except in the case of the Lady's Slipper (*Cypripedium calceolus*), in which there are two anthers. The anther is two-celled, and the pollen is united by threads into pear-shaped masses (*pollinia*), which have a stalk (*caudicle*) ending below in a sticky gland. The ovary is below the perianth, and from its length may be mistaken for the stalk of the flower. In most cases the ovary (occasionally the footstalk instead) is twisted, in order to bring the lip below instead of above. The stigmatic surface is that portion of the column facing the lip, and the style is continued above it to form a beak (*rostellum*) over it.

This is a long and tedious description that cannot altogether be made in plain language, but Orchid structure is so greatly modified from what we find in other families that without some such explanation the group would be very puzzling. We will now revert to our Plate.

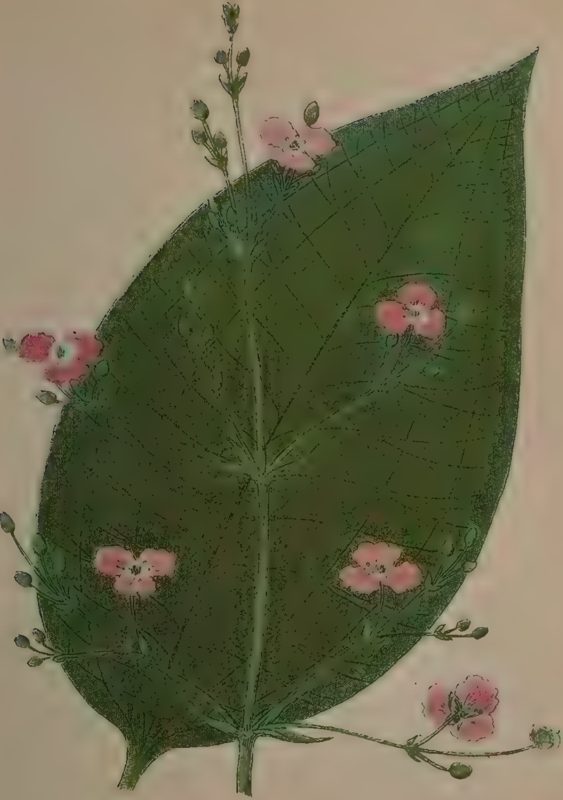
The Bird's-nest Orchis (*Neottia nidus-avis*) may be passed at a short distance as one of the Broom-rapes (*Orobanche*), so similar in general form and colour are they. The stout stem, about a foot and a half long, and yellow-brown, is naked but for a few distant scales. The flowers, very similar in colour to the stem, form a raceme, which may be found in beech woods in June and July. The large lip is divided into two lobes at its extremity, and at the other end is hollowed out into a basin-like cavity. The other sepals and petals are incurved to form a sort of hood over the essential organs.

There is not a particle of green colour about the plant, and this denotes that it does not have, as ordinary plants have, to elaborate the raw material of which its flowers are composed. Beneath the surface of the soil there is an interlaced mass of fleshy shoots which have gained the plant its name from a supposed resemblance to a nest. These fleshy fibres serve the office of roots, but they absorb only the decomposed portions of the dead leaves among which they run. The absorption of this *organized* material does away with the necessity for the green colouring matter (*chlorophyll*) which alone enables plants to manufacture starch from the carbon of the air and moisture from the soil. The Bird's-nest Orchis is a saprophyte, and in its mode of life it approaches, therefore, to the Fungi.

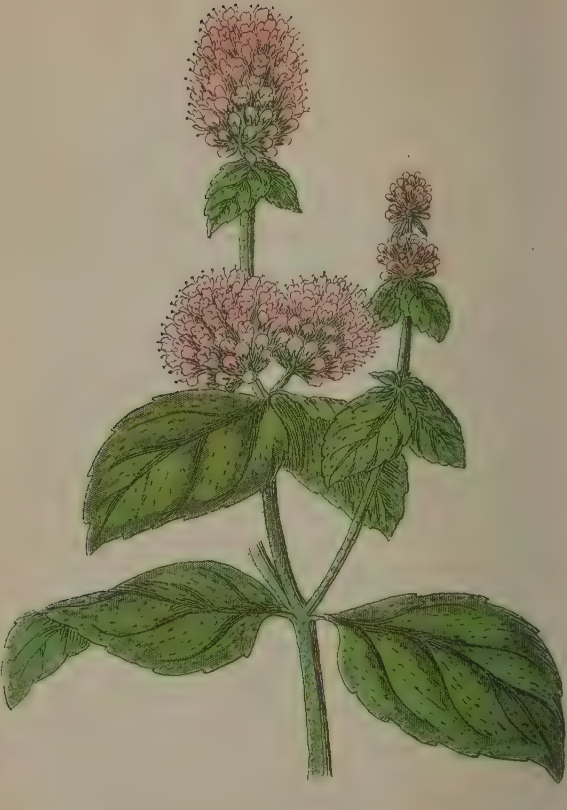
This is the only native species of a small genus, whose name is the Greek for bird's-nest.

Water Plantain (*Alisma plantago-aquatica*).

In spite of its name, in spite of its leaves, there is no relationship subsisting between *Alisma* and the true Plantains (*Plantago*). It is a fibrous-rooted perennial, with a short stem, swollen and fleshy at its base. The leaves are very large (8 or 9 inches long), supported on thick but soft stalks, two or three times the length of the leaf proper. These stalks are very broad at the base, concave, and overlap each other. The leaf-blade, with its five or seven parallel veins, bears a close superficial likeness to that of the Greater Plantain (*P. major*), though that of *Alisma* is much thinner and smoother. These leaves are more or less erect, and well-disposed for effect, so that the plant is worth growing for ornamental purposes. From the centre of the leaf-bases the flowering stem rises to a height of 3 or 4 feet. It is bluntly triangular in section, leafless ; but



Water Plantain.
Alisma plantago-aquatica.
ALISMACEÆ.



Water Mint.
Mentha aquatica.
LABIATÆ.

2 Pl. 23

C 27

about halfway up there is a whorl of narrow bracts, and from their axils flowering branches are given off. Each flower has a long, slender footstalk, and consists of three green sepals, three much larger pale rosy petals with yellow claws, six spreading stamens, and from twenty to thirty carpels. The bases of the stamens project, and on each side of them there is a honey-gland—twelve in all. The plant flowers from June to August, and may be found in ponds, ditches, and streams, plentifully in the south, rare in the north. The thick, fleshy base is rich in farinaceous matter, and when deprived of its natural acridity by drying, is available for food; the Kalmucks so use it. There is another British species:—

The Lesser Water Plantain (*A. ranunculoides*). Similar, but smaller. The leaves narrow, lance-shaped, three-nerved, about 3 inches long. Flowering stem about 1½ feet. Flowers pale purple, larger in proportion to plant than those of *A. plantago*. Bogs and ditches, May to September.

The name is said to be from a Celtic word, *alis*, water, in allusion to the habitat of these plants.

Water Mint (*Mentha aquatica*).

Everybody knows a Mint when he comes upon it, by reason of its pungent odour, well represented by Spear-mint (*Mentha viridis*), the cultivated herb of kitchen gardens. Spear-mint is held to be only a naturalized, not a native species, unless it be in one corner of our country—West Yorks. We have, however, seven—some say ten—species that may be set down as natives, but they are a rather troublesome group for the botanical student; there are so many varieties, hybrids, and sub-species, which tend to connect the species and make it difficult to determine the identity of some specimens. With the exception of the Corn-mint (*M. arvensis*), they are all inhabitants of wet and marshy wastes, flowering in August and September. They are Labiate plants; that is, members of a family distinguished by having square stems with opposite leaves, and a tubular corolla whose five lobes form two unequal lips to the mouth of the tube. In the case of the Mints these flowers are individually small, but rendered more conspicuous by being borne in dense whorls, the whorls being often so many and so close together as to form long spikes of bloom. They are all perennial herbs, with creeping rootstocks on or just below the surface of the ground, and giving off runners freely. *Mentha aquatica* has oval, hairy, stalked leaves, the edges indented with rounded teeth. Flower-spikes dense, though with slight intervals between the whorls. The colour of the flowers varies from lilac to purple. The other species are :—

I. Horse-mint (*M. sylvestris*). Leaves stalkless, more tapering to a point than in *M. rotundifolia*, smooth above, sharply toothed, whitish beneath. Stem covered with white woolly hairs. Flowers lilac, spike continuous. Rare.

II. Round-leaved Mint (*M. rotundifolia*). Leaves stalkless, wrinkled above, woolly beneath, round-toothed. Flower-spikes dense, pink or white.

III. Peppermint (*M. piperata*). Leaves stalked, margins with large teeth, smooth above, a few hairs along the nervures underneath. Flowers purplish in spikes.

IV. Marsh-mint (*M. sativa*). In this and the two following species the whorls are produced from the axils of the leaves instead of as a terminal spike. The leaves are stalked, with sharp teeth. Flowers purplish. The throat of the calyx smooth, calyx-teeth lance-shaped, ending in a fine point.

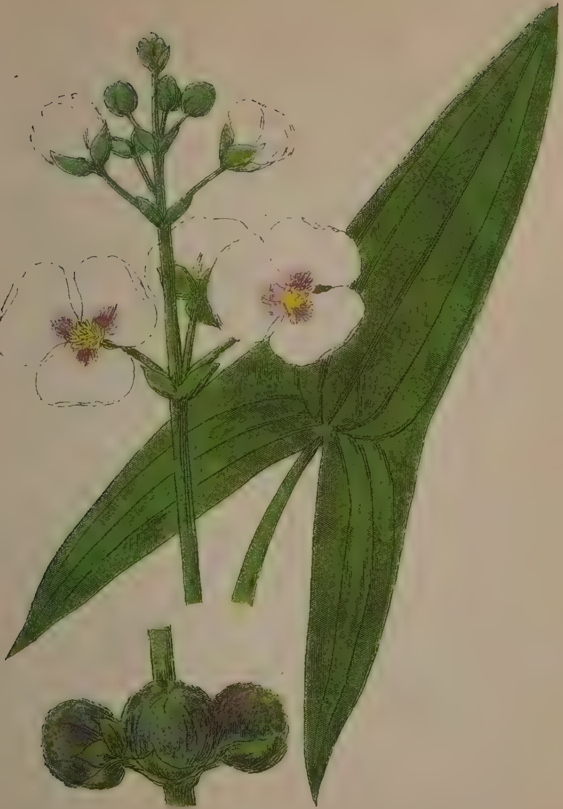
V. Corn-mint (*M. arvensis*). Leaves with blunt teeth. Calyx very hairy, teeth shorter than in last, triangular. Corolla hairy, purplish. Cornfields and waste places.

VI. Pennyroyal (*M. pulegium*). Calyx two-lipped, downy or hairy, with hairy throat. Leaves small, with short stalks, slightly toothed, recurved. Stem much-branched. Odour powerful.

Arrowhead (*Sagittaria sagittifolia*).

One of the most striking among the many forms of leaves that go to make up the vegetation of the sluggish stream or the canal is the aptly-named plant here figured.

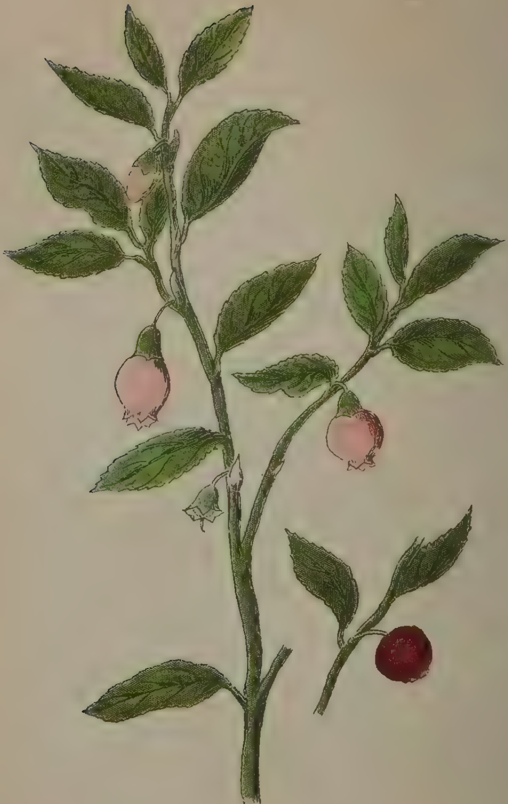
It is a perennial, the leaves are radical, and from the base of the plant runners are thrown out, each ultimately terminating in a globose tuber, in which state the plant passes the winter. The leaves are typical of what botanists describe as a "sagittate"



Arrow-head.

Sagittaria sagittifolia.

ALISMACEÆ.



Whortleberry.
Vaccinium myrtillus.
ERICACEÆ.

2 Pl. 25

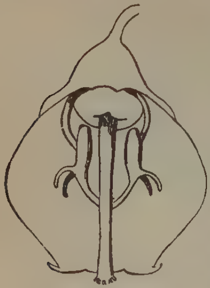
C 29

or arrow-shaped leaf, and their long stalks are three-edged. The stem is leafless, but bears a number of flowers in series of threes. These flowers are of two kinds, staminate and pistillate, and because they are borne upon the same plant, botanists describe *Sagittaria* as *monœcious*, just as they describe the Hop as *diœcious*, because its two sexes are on different plants. There are three sepals, and three large white petals with purplish spots at their base. The lower flowers contain carpels only, which are many in number, and which develop into a compact head of nut-like fruits—shown at the foot of our plate. The stalks of these pistillate flowers are shorter than those of the staminate flowers above them, which contain purple anthers. It flowers from July to September, and is frequent in England as far north as Cumberland, as an indigenous plant; in Scotland it has become naturalized, and in Ireland it is of local occurrence. It is the only British species.

The name is from the Latin *sagitta*, an arrow.

Whortleberry (*Vaccinium myrtillus*).

The Whortleberry, Blaeberry, Bilberry, or Blackheart, is a shrub with glossy stems and leaves, which grows as abundantly and as thickly as heather on some of our hills. It forms a splendid cover for small creatures, growing to a height of about 2 feet, sometimes higher. Its stems are angular, smooth, like the leathery, oval, alternate leaves, and rise from a creeping rootstock. The young leaves have a beautiful rosy tint, which is soon exchanged for a dark green, but they get the rosiness back again when autumn touches them. The flowers are rosy and pitcher-shaped (*urceolate*), the short neck and mouth of the pitcher being formed by the four or five turned-out lobes of the corolla. This is an interesting flower to show to a person ignorant of the beautiful cross-fertilization arrangements of plants. Owing to the curving of the short flower-stalks, the flower hangs with its mouth downwards. The simple style occupies the centre of the flower, and its thickened end appears at the mouth of the pitcher. As it hangs the stigmatic portion is the sticky under-surface of this thick end. The stamens are ranged all around ; their anther-cells in the shape of two tubes with spreading arms on their backs, so that entrance to the pitcher is barred by a series of radiating awns. The anther-tubes have open ends when the pollen is ripe, but the openings are pressed against the style. Now this flower produces much honey, so that bees desire to get their long tongues at the honey-glands within ; but when a bee comes on this business her face knocks against the stigma, and either in that way or by touching against the awns with her tongue the anthers are moved and the loose pollen falls out on the bee's hairy face. Upon visiting another Whortleberry flower some of this pollen must be detached by the sticky stigma, and so a healthy crossing is effected ! In due time the ovary develops into a succulent blue-black berry, with a fine glaucous bloom upon it. Flowers April to June.


Section of flower.

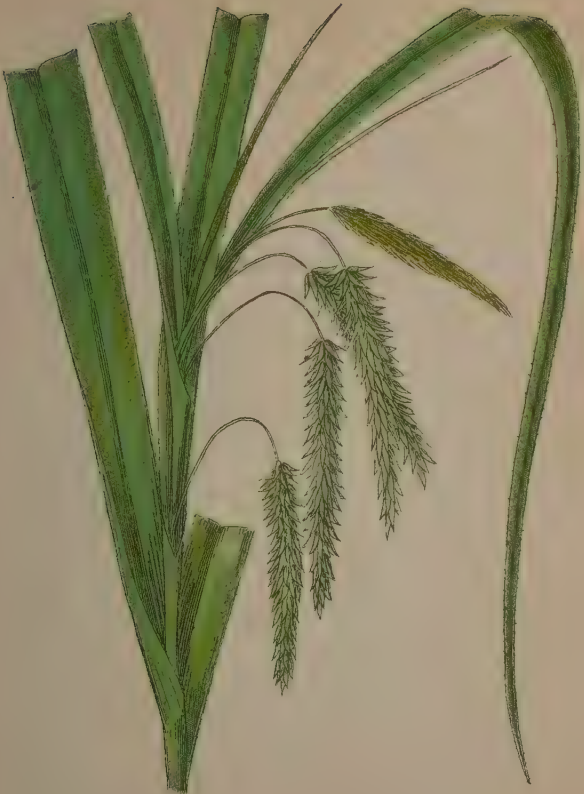
There are three other British species :—

I. Bog Whortleberry (*V. uliginosum*). Found in mountain bogs and copses not south of Westmoreland and Durham. Differs from *V. myrtillus* in the possession of *round*, woody stems, not erect ; leaves *not* toothed, glaucous beneath ; flowers in clusters of two or three ; berry smaller. Flowers May and June.

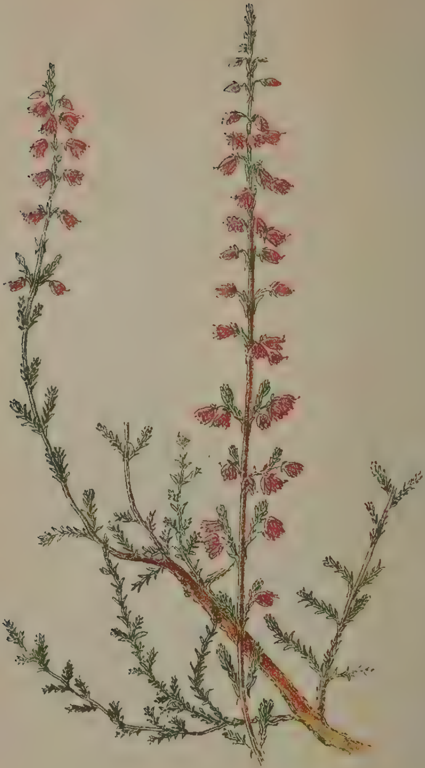
II. Cowberry (*V. vitis-idæa*), with *downy* stems, evergreen leaves dotted beneath, edges curled back ; flowers in crowded, open racemes ; anthers without awns. Berry red, and of acid flavour. Not found in South-East England. Flowers pink, June and July.

III. Cranberry (*V. oxycoccos*). Creeping amongst *Sphagnum* in peat-bogs. Only a few inches in height. Leaves evergreen, with edges curled back, glaucous beneath. Corolla split into four narrow segments and rolled back, the yellow anthers protruding. Flowers rosy, June to August ; berries red.

Name uncertain ; but probably corruption of *baccinium*, from Latin, *bacca*, a berry.



False Cyperus.
Carex pseudocyperus.
CYPERACEÆ.



Heather.
Calluna vulgaris.
ERICACEÆ.

2 *Pl.* 27

C 31

False Cyperus (*Carex pseudo-cyperus*).

Though not so common as many other Sedges the False Cyperus is plentiful enough in many localities, and it offers the advantage from our point of view of being large and distinctive, enabling points of structure to be made out more easily. There are many British species—Hooker gives sixty, Babington seventy-five—and until one comes to specialize in Carices they appear very much alike, as in the case of the Grasses. Some species, however, arrest attention at sight as being very distinct, and the False Cyperus (*Carex pseudo-cyperus*) is one of these. To see a clump of it for the first time as it grows on the margin of lake or stream, is to desire to know its name and something about it.

The Sedges (*Carex*) are all perennial herbs, and their superficial appearance is like that of coarse grasses. They are related to the Bulrush (*Scirpus*), which we have already described (*see* page 22), and their floral arrangements are very similar. We have the same inclusion of many flowers in a spikelet, but some are male and some female, instead of the two sexes being in one flower. In the False Cyperus this is carried a stage further, the slightly drooping upper spikelet in our plate being male, whilst the four stouter hanging spikelets are female. The male flowers have no other covering than the glumes, but the females are enclosed in a bottle-shaped sac, the *perigynium*. The glumes end in long, toothed points which curve outwardly and give a distinctive appearance to the catkin-like spikelet. The flowers should be looked for in June.

The stem of this species, which grows to a height of 3 feet, is three-sided and rough. The long flat, strap-shaped leaves are also rough, and measure about $\frac{1}{2}$ inch in width.

The name of the genus is from the Greek *Keiro*, to cut, from the sharpness of the edges of the leaves.

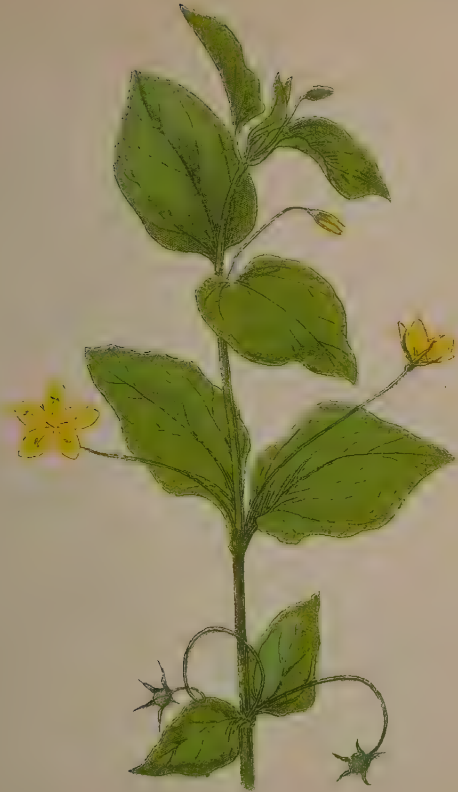
Heather or Ling (*Calluna vulgaris*).

The Ling is distinguished from the Heaths by the botanist because its corolla is concealed by the longer, equally coloured calyx leaves, and below these are four bracts which resemble a calyx. Its leaves are triangular, very minute, and densely packed, overlapping each other in four rows along the branches. Like the Heaths, its flowers are persistent, and are to be found bleached, but preserving much of their original form, nine or ten months after they have opened. The corolla has not merely four short lobes at the mouth of the bell, but is deeply split into four parts. The anthers are short, and contained within the corolla, but the style is long, and protrudes. The tough, wiry stems attain considerable size in the highlands of Scotland, where they serve many useful purposes. It flowers from July till September.

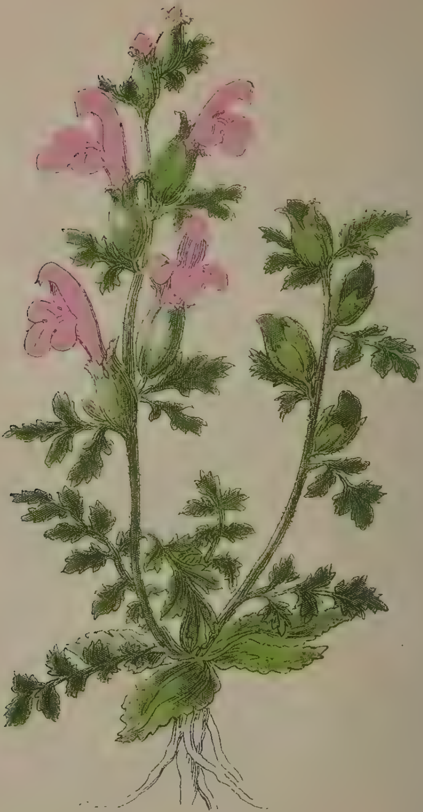
C. vulgaris is the only species of the genus, which gets its name from the Greek *Kallino*, to beautify or adorn—an epithet whose fitness will be admitted by all who have visited the moorlands in any part of our country during its flowering season, though it must be confessed that the name was bestowed because the Heather was made into brooms, which did the beautifying by sweeping.

Yellow Pimpernel (*Lysimachia nemorum*).

To town-dwellers one of the most familiar of plants is the Creeping Jenny (*Lysimachia nummularia*), which is a favourite pot-plant with those unfortunate individuals whose attempts at gardening are restricted to their window-sills. It is sometimes pathetic to see this plant flourishing in a narrow court of a congested poor district. Sometimes one may see its long leafy stems forming green fringes to the windows of several floors of



Yellow Pimpernel.
Lysimachia nemorum.
PRIMULACEÆ.



Lousewort.
Pedicularis sylvatica.
SCROPHULARIACEÆ.

a tenement house, showing that such efforts at gardening under difficulties are infectious. Such a plant is not the best adapted for pot culture, for its naturally prostrate stems want a moist shady bank into which they can root at intervals. Where such specimens keep their foliage fresh during the Dog-days, it is mostly due to the fact that they have abundant shade, and that care is taken to supply them with water.

Creeping Jenny and Yellow Pimpernel (*L. nemorum*) are very closely related, and it will be well to consider them together, for they are very much alike, and affect similar natural habitats. They are both perennials. Creeping Jenny has stems about a couple of feet in length, with opposite roundish leaves on short stalks, and with glandular dots. From the base of the leaf-stalks roots attach the stem to the soil and make the starting-point for a new plant. The flowers are yellow, cup-shaped, and produced singly from the axils of the leaves. The sepals are broad, oval pointed, and the corolla, which is ¾ of an inch broad, is split into five lobes with delicately fringed edges. The filaments of the stamens are all united by their bases. It affects moist shady places in copses and thickets, and near ponds and streams, flowering in June and July.

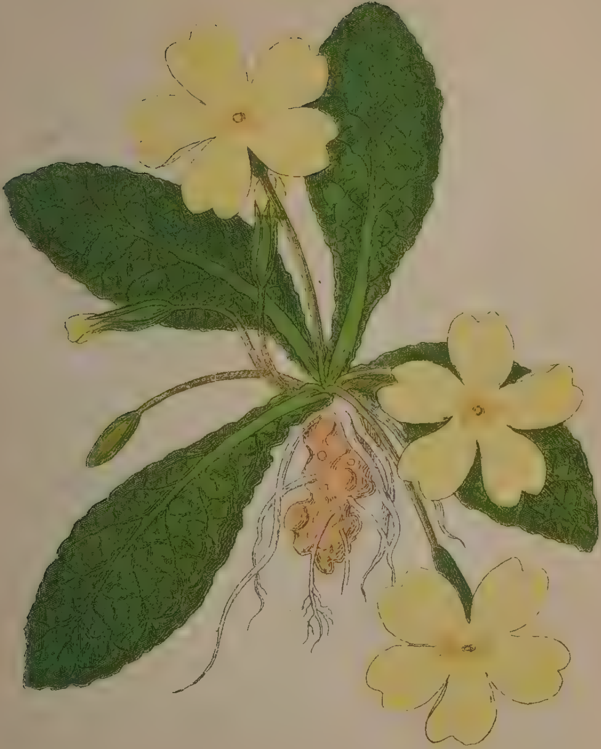
The Yellow Pimpernel or Woodland Loosestrife (*Lysimachia nemorum*) has shorter, more slender stems, that recline rather than creep on the ground. The leaves are larger, more oval, running to a point, without glands, and of a more yellow green. The yellow flowers are smaller (⅔ inch), of the form known as rotate, with the unfringed lobes more spread out, and on very slender, long curved stalks. The filaments of the stamens are not connected. The flowers appear in succession from May to July, and are succeeded by small globular seed-vessels, very much like those of the Scarlet Pimpernel (*Anagallis arvensis*). The Creeping Jenny does not fruit in this country. The Yellow Pimpernel may be found in damp places in woods and copses, often in great patches.

There are two other native species of *Lysimachia* whose habit is entirely different, and they are treated on page 68.

Lousewort (*Pedicularis sylvatica*).

Wherever we find Lousewort growing we may be sure that the pasturage is poor, and liable to bring the flocks into bad condition, making them fit subjects for the attacks of parasites. Our forefathers knew this, but they regarded an innocent plant as the cause, instead of its being a mere sign ; and so they called it Lousewort, just as to the Marsh Pennywort (*Hydrocotyle*) they gave the names of White Rot and Sheep Rot, and to Sundew the name of Red Rot, under the mistaken notion that it was the presence of these plants alone that rendered marshy ground unfit for pasture land.

The Lousewort has a short perennial rootstock, from which proceed several branching stems, which trail along the ground and spread all around. The leaves are much divided and feathery. The flowers are in loose spikes with bracts. The calyx-tube is angular, and split at the front into five lobes, of which the upper one is as it should be, but the others appear to be ambitious to become leaves. The corolla forms a long tube ending in two rosy lips, of which the lower is divided into three lobes, the upper two. This upper one is longer and compressed at the sides; within it the four stamens are hidden, two on each side. The anthers open on the inner side to discharge their pollen, and they are arranged in two pairs in such a way that the inner faces are pressed together, and the ripe pollen thus prevented from falling. But in order to get at the honey, a bee has to press open the upper lip of the corolla, and in so doing separates the anthers and lets down a shower of pollen, some of which will be carried away, and then detached by the stigma of the next flower visited, for it stands out before the anthers. It flowers continuously from April to August.



Primrose.
Primula vulgaris.
PRIMULACEÆ.

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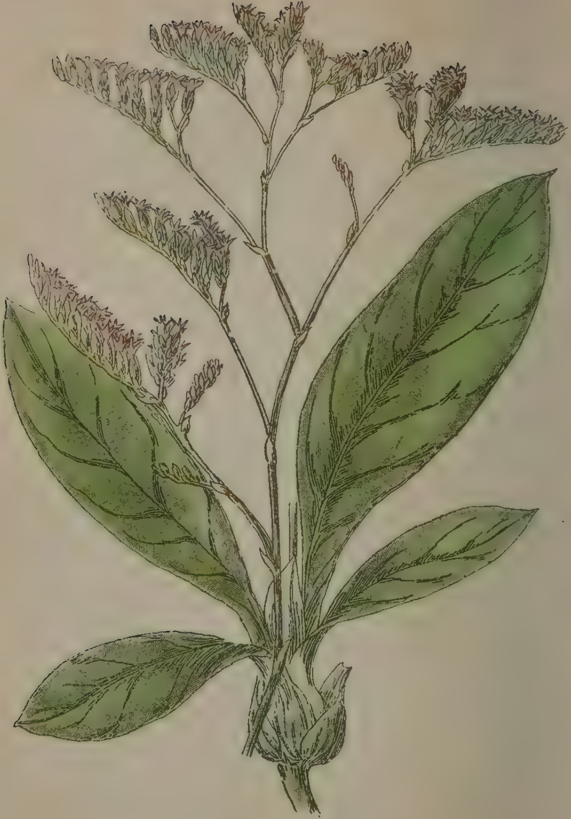


Sea Lavender.
Limonium vulgare.
PLUMBAGINACEÆ.

There is another species, the Marsh Lousewort (*P. palustris*), an annual which grows erect to the height of 1 foot or more, in marshy places, branching above, but not from the base. The corolla is a duller crimson in colour, and the upper lip has *three* lobes as well as the lower. Flowers May to September. Both species are parasitical upon various roots.

The name is from the Latin, *pediculus*, a louse, reflecting the vulgar designation.

Primrose (*Primula vulgaris*).

The Primrose is one of those plants that are so thoroughly well known and loved by all classes, that it seems quite unnecessary to include either illustration or description in a volume intended to assist the rambler in identifying wild flowers. And yet the absence of a Primrose plate from the earlier editions of this work was strongly resented by some of our friends, who felt that any work on British wildflowers that did not figure the Primrose, the Daisy, and the Dandelion was not fully to be trusted. We have now made good that defect so far as showing a few blossoms and leaves are concerned, for a Primrose plant with all its leaves and its truss of flowers is impossible on our small page.

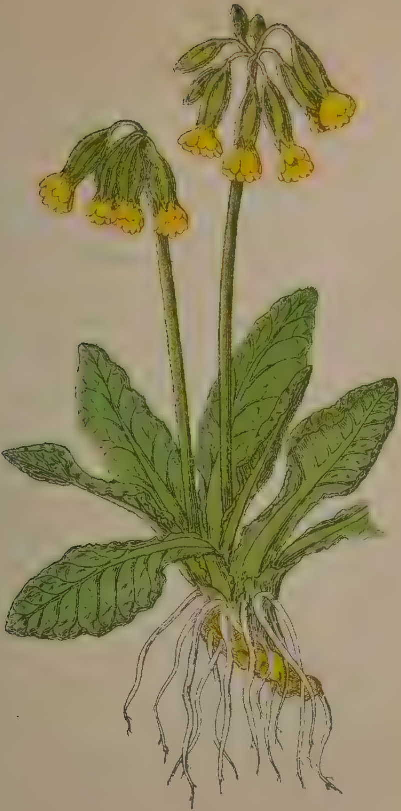
The Primrose is a perennial with a thick fleshy rootstock underground, from which spring the tuft of soft wrinkled leaves and the crowd of flower-buds at their heart. On the underside the leaf is covered by a network of stout veins, and is softly hairy. The flowers are on long slender footstalks of a pinkish hue, all springing from one common stout flower-stem, which is so short as to be hidden among the bases of the leaves. In the var. *variabilis* (the origin of the garden Polyanthus), commonly taken for the Oxlip, this flower-stalk develops to considerable length, as in the Cowslip (page 37). The flowers have an inflated, five-angled calyx, and a funnel-shaped corolla with contracted mouth and broad spreading lobes. The corolla is 1½ inch across, and of a very delicate pale tint of greenish yellow, the mouth of the tube encircled by five triangular patches of deeper yellow. The flowers are of two forms so far only as the contents of the tube are concerned: one form having a long style, with the anthers attached about halfway down the tube; the other with a short style whose stigma only reaches halfway up the tube, and the anthers just inside the mouth of the tube. This matter is referred to at greater length under Cowslip, which agrees on these points. The great flowering time is April and May, when the woods are full of its flowers, but individual plants here and there may be found with small scanty blossoms throughout the winter.

The name of the genus is derived from the Latin, *primus*, first. The other native species will be found briefly described on page 38.

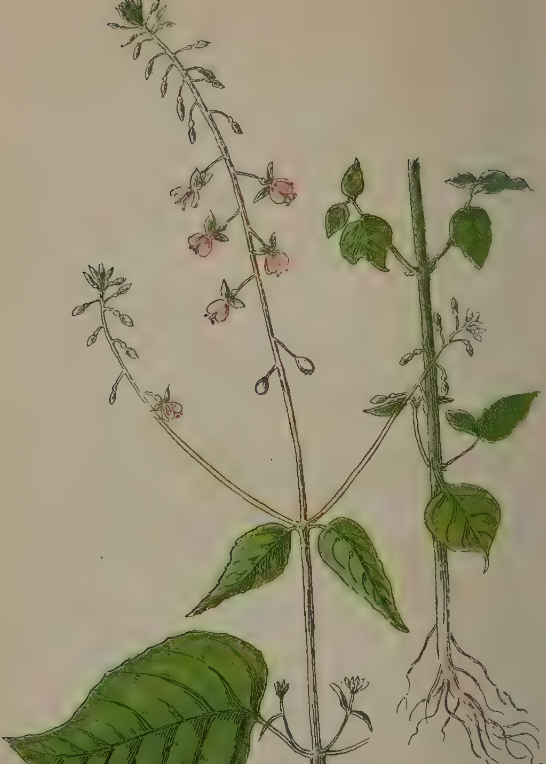
Sea Lavender (*Limonium vulgare*).

Where the Sea Lavender grows, on sand-dunes by the sea and on muddy shores, it may often be seen covering great tracts with continuous sheets of purple bloom, reminding one of the purple heath on the moorlands and hills. We have four native species of the genus, all perennial herbs. All the leaves spring directly from the rootstock in each species, and are lance-shaped. The flowers are of regular shape, their parts in fives, with short footstalks, grouped in cymes, and these arranged in panicles.

The Spreading Sea Lavender (*Limonium vulgare*) has a creeping and branching woody rootstock, sending up many angular flower-stems (12 to 18 inches), which are considerably branched in the upper part, and nearly every branch bears flowers. Not only is the corolla coloured a bluish-purple, but the green calyx has a distinctly purple tinge. There is a little tooth between the lobes of the calyx in this species only. The leaves have long stalks, and are marked with one prominent rib from which the nerves run off in pinnate fashion; the tip often ends in a minute hard point. It continues to brighten muddy seashores with its flowers from July to November.



Cowslip.
Primula veris.
PRIMULACEÆ.



Enchanter's Nightshade.
Circæa lutetiana.
Onagraceæ.

Other native species are:—

I. Upright Sea Lavender (*L. binervosum*) has a rootstock that is branched, but does not creep; it is short and upright. The leaves are on much shorter footstalks than those of *limonium*, and instead of the one rib they are marked near the base with three nerves. The flower-stems do not exceed a foot in length; they are branched from the middle. The corolla is blue-purple, but the lobes of the calyx are white. It flowers in July and August, and extends from the south coast to Wigton on the west coast, and only to Lincoln on the east.

II. Alderney Sea Lavender (*L. lychnidifolium*) has large many-nerved leathery leaves. Flower-stems stout, tapering upwards, with triangular scales at base of branches; bracts broad, dark coloured The calyx teeth are triangular. It flowers in July and August. It is a native of the French coasts, but in 1900 Mr. C. R. P. Andrews found it growing on low rocks by the sea at Alderney.

III. Matted Sea Lavender (*L. bellidifolium*). Rootstock much branched and matted; the leaves spoon-shaped, on short stalks, ribbed *and* three-nerved, small and few. The stems are branched from a little above the rootstock, the branches being of a zigzag character, and few of them bearing flowers. The flowers are small, pale lilac; July and August. Rare. Confined to the salt marshes of Norfolk, Suffolk, and Cambridge.

The name *Statice*, by which it is also known, was applied by the Greeks to some unknown astringent herb, and is from *statizo*, to stop.

Cowslip or Paigle (*Primula veris*).

In April and May in clayey meadows and pastures throughout England and Ireland the Cowslip is abundant; in Scotland rare. The flowers are of a rich yellow hue, and funnel-shaped, the five petals being joined to form a long tube. They are borne on short pedicels, a number of which spring from a long, stout, velvety stalk, 3 to 6 inches high. At the bottom of the tube is the globose ovary, surmounted by the pin-like style with the spreading stigma at the top. The five stamens are attached to the walls of the tube—in some flowers halfway down, in others at the top. In the first form the style is very long, so that the stigma comes to the top of the tube; in the second, the style is short, and the stigma reaches halfway up only. The flowers are consequently termed *dimorphic*, and the two forms are borne on separate plants.

Though these two forms had long been known to country children as "pin-eyed" and "thrum-eyed" respectively, it remained for Charles Darwin to point out the significance of this variation, which is to ensure cross-fertilization by the visits of insects. A bee pushing its tongue to the bottom of a long-styled flower in search for honey would have its tongue dusted with pollen halfway down, and on visiting a short-styled flower some of this pollen would be sure to become detached by the sticky stigma at the same height; and *vice versâ.* The reader may prove this experimentally by selecting flowers of the two forms and gently thrusting a fine grass stem into one after the other.

The remaining native species of the *genus* Primula are :—

I. Bardfield Oxlip (*P. elatior*). Calyx less inflated, corolla pale, like primrose, but the mouth of tube not contracted; pedicels shorter; thick stalk developed and long like cowslip. Confined to counties of Bedford, Cambridge, Suffolk, and Essex. Copses and meadows, April and May.

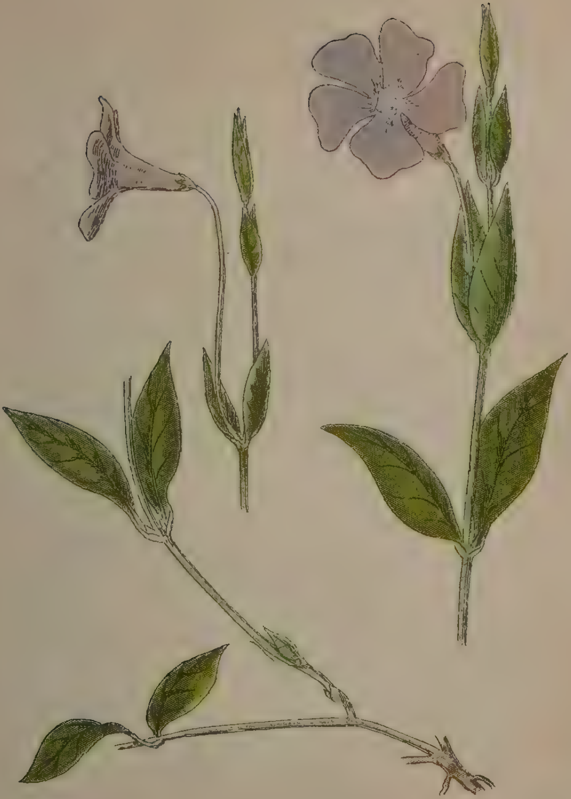
II. Bird's-eye Primrose (*P. farinosa*). The two former species have *wrinkled* leaves and angular calyx-tubes; this and the next have not, but their leaves are *very mealy* underneath. Flowers pale *purple-lilac* with a yellow eye. Bogs and meadows from York northwards. Very rare in Scotland. June and July. *Dimorphic* like all the foregoing species.

III. Scottish Primrose (*P. scotica*). Similar to Bird's-eye, but not half the size, though stouter in proportion. Flowers *purple-blue* with yellow eye. *Not* dimorphic. Pastures and sandy heaths in Orkney, Caithness, and Sutherland, June to September.

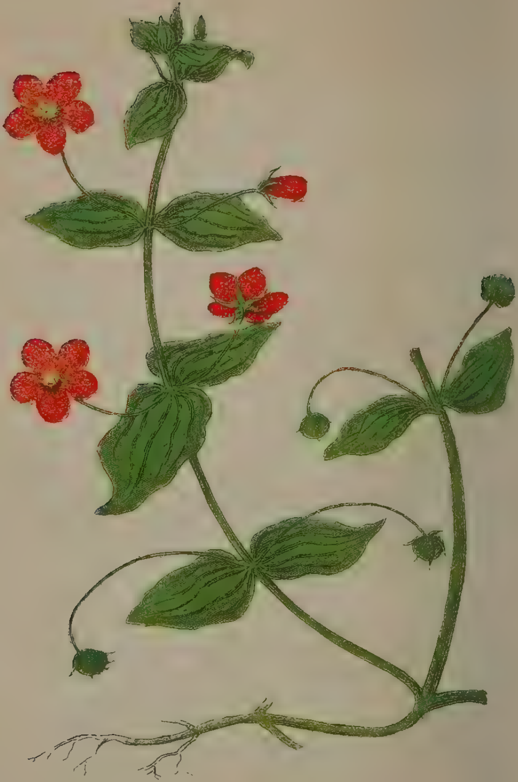
Enchanter's Nightshade (*Circæa lutetiana*).

Along the glades of damp woods, standing close beside the thickets and the undergrowths beneath the oaks, there will be found a tall slender plant with long-stalked, large, oval opposite leaves, whose margins are faintly toothed. The rounded stem ends in a long branched raceme of pale pink flowers. This is the Enchanter's Nightshade (*Circæa lutetiana*), so called not on account of even the most remote relationship to *Atropa* or *Solanum*, but because of some resemblance between the leaves of *Atropa* and *Circæa*.

If the downy leaves be held between the eye and the light,



Lesser Periwinkle.
Vinca minor.
Apocynaceæ.



Pimpernel.

Anagallis arvensis.

PRIMULACEÆ.

the leaf-stalk will be seen to be studded with pellucid dots, after the manner of Perforated St. John's Wort. Some of the lower leaves are as much as 3 inches long; whilst the flowers are only about $\frac{1}{8}$ of an inch across. The flower is remarkable in spite of its smallness, for all its parts are in twos. The hairy, tubular calyx has two lobes, there are two heart-shaped petals, two pink stamens, and the ovary is two-celled, and when it develops into an egg-shaped fruit, covered with hooked bristles, it will be found to contain two seeds. The genus is included in the same family (*Onagraceæ*) with the Willow-herbs (*Epilobium*) and the Evening Primrose (*Œnothera*), which have the flower parts in fours. Enchanter's Nightshade may be found in flower from the middle of June to late in August.

There is one other British species :—

Alpine Enchanter's Nightshade (*C. alpina*), a smaller plant of hilly woods, not south of Gloucestershire and North Wales. It is less than a foot in height, of stouter build than its congener, with glossy heart-shaped leaves, which are more strongly toothed. The leaf-stalks, which are proportionately longer, are flattened, and expanded into wings along the sides. The petals are divided into two oblong lobes; the ovary is less bristly and one-celled, and the fruit contains but one seed. It flowers in July and August.

The genus is named after Circe, the Enchantress, but why no man knows.

Lesser Periwinkle (*Vinca minor*).

The Lesser Periwinkle is perhaps more familiarly known as a garden plant than as a wild-flower, and the former would appear to be its true character. It is now truly wild, in the Southern English counties at least, having probably been introduced by man at an early date (Chaucer mentions "fresh pervinke rich of hew"), and taken care to keep the foothold thus obtained. Its favourite position is a woodland bank, which it thickly covers with its dark evergreen leaves. Hooker ("Students' Flora," page 268) describes the flowering stems as short and erect, and the peduncles not so long as the diameter of the corolla. As a matter of fact, the long trailing and rooting stems also bear flowers, and the peduncles vary in length from $\frac{1}{4}$ to 2 inches.

The five blue petals are united for half their length to form a tube, and the five free lobes are oblique : the corolla as a whole being salver-shaped. The structure and arrangement of the stamens and pistil are very curious, and evidently have relation to cross-fertilization by insects, for the throat of the corolla-tube is closely guarded by a fringe of silky hairs, impassable by the thrips that vainly haunt the mouth in quest of pollen. The style expands at the top into a cup-shaped stigma so broad as to nearly fill the space between the converging anthers, so that only an insect with a long thin tongue can reach the honey-glands at the base of the style. The edge of the stigma-cup secretes adhesive matter, and the insect's proboscis in passing over it gets smeared, with the result that when it is again withdrawn it picks up pollen from the anthers, and the insect goes to the next flower fully charged with pollen, which becomes transferred to the stigma. In spite of this careful contrivance, the plant rarely, if ever, produces seed in this country. Flowers April and May, and sparingly throughout the year.

The Greater Periwinkle (*Vinca major*) is also naturalized in places. It is much larger in every respect than *V. minor*. The name of the genus is supposed to have been derived from the Latin *Vincio*, to bind or connect, in allusion to the manner in which its trailing stems thrust down a root from every node. This habit may partially account for the rarity of seed-production, the perpetuation of the species being sufficiently ensured without them.

Pimpernel (*Anagallis arvensis*).

The Scarlet Pimpernel, or Poor Man's Weather-glass, is one of those wild flowers with which every country-dweller is acquainted, for it has long enjoyed a reputation as a cheap barometer, in consequence of its habit of closing the petals over the essential organs on the approach of rain. But this is only a reliable indication in the morning, for it invariably closes soon after two p.m., rain or shine. The genus *Anagallis* belongs to the order Primulaceæ, of which we have already given examples. It has a square stem, which lies along the ground, and sends up many erect branches. The stalkless leaves are oval, the margins without teeth, usually borne in pairs, but occasionally in threes or fours. The flowers are produced singly, on very long and slender stalks, from the axils of the leaves. The sepals are narrow, sharp-pointed, almost as long as the wheel-shaped corolla. When the flower has passed, its long stalk curves downwards with the globose seed-vessel. When this is ripe it opens by a clean fissure all round, so that the upper half falls off and discloses the numerous seeds. There is a form often found with blue flowers, which was formerly regarded as a distinct species, but experiments with the seeds have proved it to be a mere variety. One or other of these forms is common in all fields and wastes from May till November.

The only other British species has been described on page 14.

Ramsons (*Allium ursinum*).

Ramsons is otherwise known as the Broad-leaved Garlic, a strong-smelling, pungent plant with a bulb like an Onion in the ground ; it is, in fact, closely related to the Onion (*Allium cepa*), though that is not a native plant. The leaves, instead of being tubular as in the Onion, are spread out broadly lance-shaped, 6 or 8 inches long, like those of the Lily of the Valley, for which indeed they are often mistaken before flowering ; and they have leaf-stalks which sheathe the base of the flower-stem. This flower-stem (*scape*) is three-sided, and supports an umbel of about twelve pure white starry blossoms, rich in honey, but giving forth the characteristic odour of garlic that is not pleasing to British nostrils. When the scape first emerges from amid the radical leaves the flower-buds are all wrapped up in a two-leaved envelope (*spathe*). When the flowers are open these leaves will be found immediately below the umbel. There is no distinction between calyx and corolla; the two combined are therefore termed the perianth, and this consists of six segments, which spread widely. There are six stamens, which mature and shed their pollen in succession before the stigma is ripe. It will be found in damp woods and shady hedgerows, often in great communities, and flowers from April to June.

There are six other British species, most of them very rare. The least rare are the following :—

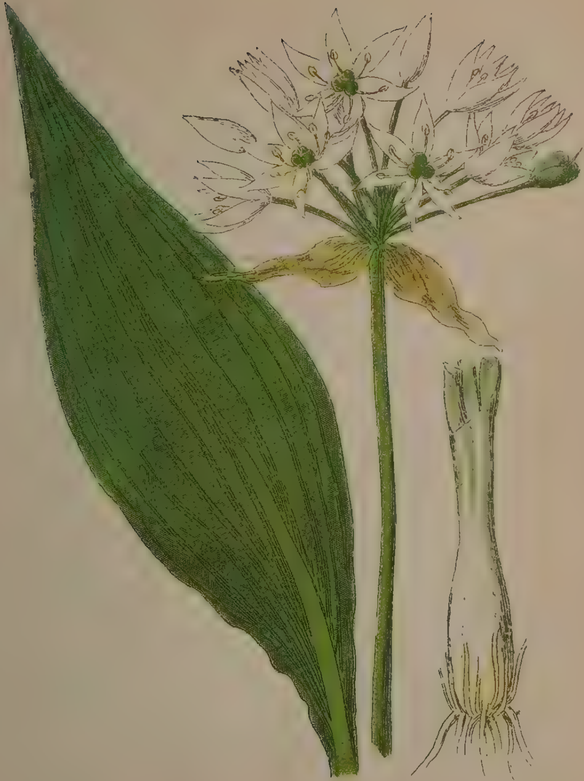
I. Crow Garlic (*A. vineale*). With a small bulb and tubular leaves, 1 foot or 2 feet long, flattened or grooved towards their extremity. The spathe in this species is single. The flower-head appears after the leaves have faded, and usually consists of a crowd of small green or purple bulbils, from amid which rise a few pink or greenish flowers. These bulbils are about ½ inch across when fully developed, and serve in lieu of seeds for propagation. It is a plant of fields and dry wastes, where it flowers in June and July.

II. Field Garlic (*A. oleraceum*). Bulb small; leaves slender, half rounded, 2 feet long, roughly ribbed, and flattened towards the end. Spathes two. Flower-head not crowded; flowers pink or greenish-brown, springing from among the bulbils. Borders of fields in southern counties, and in East of Scotland; July.

The name *Allium* is the old Latin for garlic.

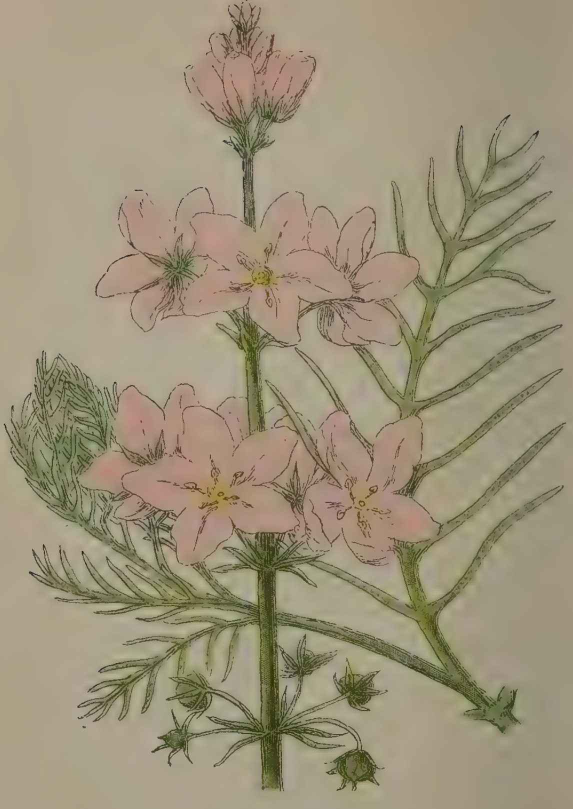
Water Violet (*Hottonia palustris*).

The Water Violet is not so near being a real Violet as it is a Primrose. When aquarium-keeping was a fashionable rage, *Hottonia* had a fair chance of extirpation; but probably the botanist is the only one who wants the entire plant now, though every person who sees the beautiful pyramid of flowers desires to gather it. It has long, silvery-looking roots, sometimes imbedded in the mud at the bottom of ponds and ditches,



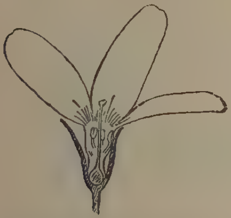
Ramsons.
Allium ursinum.
LILIACEÆ.

2 Pl. 36 *D 42*

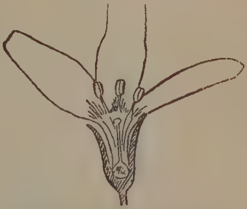


Water Violet.
Hottonia palustris.
PRIMULACEÆ.

sometimes suspended halfway in the water. The branches bear dense tufts of light feathery leaves, which are all submerged. The flower-stem is from 1 to 2 feet in length, standing well above the water, and bearing the honeyed flowers in whorls well apart. Each flower is on its own footstalk, which stands in the axil of a slender bract; and consists of a five-parted calyx, a white or lilac corolla of salver-shape, cut into five long lobes, and with a yellow centre. The stamens and pistil are similar to those of the Primrose, and, like that plant, this bears flowers of two forms. The stigma in the short-styled form stands just within the mouth of the tube, whilst the stamens on their long filaments tower above it; but in the long-styled form it is the style and stigma that project beyond the mouth, whilst the stamens with short filaments are halfway down.



Water Violet: long-styled form.



Water Violet. short-styled form.

Some of the buds are like certain ones in the Violet and Wood Sorrel, and never open (*cleistogamic*), though they produce fertile seeds. In *Primula* and *Lysimachia* the seed capsule opens at the top, in *Anagallis* it splits around its circumference, but in *Hottonia* the same form of vessel splits into five segments, which are connected only at top and base. It flowers in May and June; and is not found north of Durham and Westmoreland, nor west of Somerset, nor south of Somerset and Surrey.

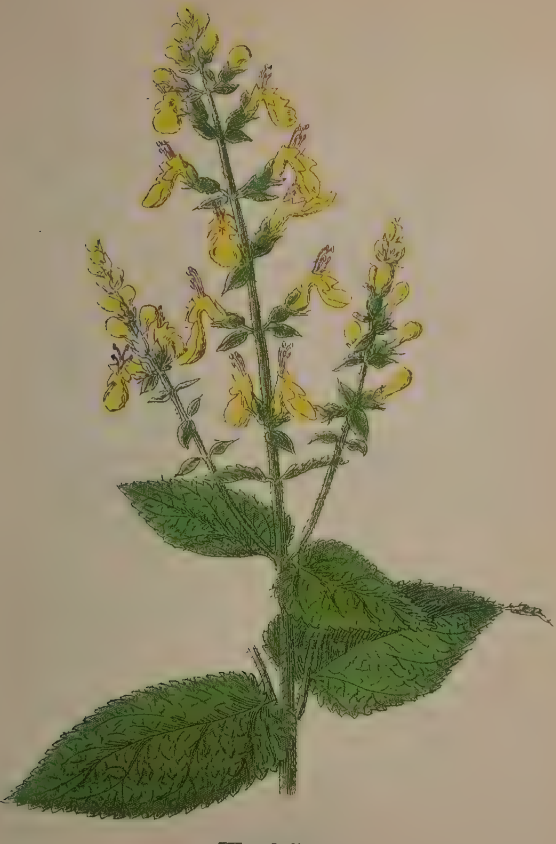
The genus (of which this is the only British species) was named by Linnæus in honour of a professor of botany at Leyden, Pierre Hotton, who died 1709.

Wood Sage or Germander (*Teucrium scorodonia*).

Should the novice encounter *Teucrium* before it commences to flower he might be pardoned for mistaking it for Sage. It is a plant of the dry wood and the stony hedgebank, whose reddish square stems and peculiar flowers mark it at once as a Labiate. It has a woody perennial rootstock that gives off runners under the surface of the ground, and erect stems in tufts, as much as 2 feet in height. The soft, wrinkled, and downy leaves are in pairs at a distance from each other ; stalked. The flowers are in racemes 5 or 6 inches in length, with stalked bracts. The calyx is bell-shaped ; the corolla yellowish-white with a pinkish tinge, looking as though the upper lip had been cut off obliquely. There are four purplish stamens, two long and two short, and a long pistil ending in two spreading lobes.

Now, when the flower first opens the stamens stand nearly erect, their upper ends curved slightly forward, so that when an insect alights upon the roomy lower lip and looks into the corolla for honey, its head will come in contact with them and remove the pollen. When these stamens have shed their pollen they curve backwards out of the way, and the pistil matures, opens her stigma-lobes, and bends forward to occupy the precise position previously held by the anthers, so that when an insect comes from a younger *Teucrium*-flower with pollen on its head, the stigmas will detach a portion. This action should be well studied when the flowers are out, that is, from July to September. The other species are :—

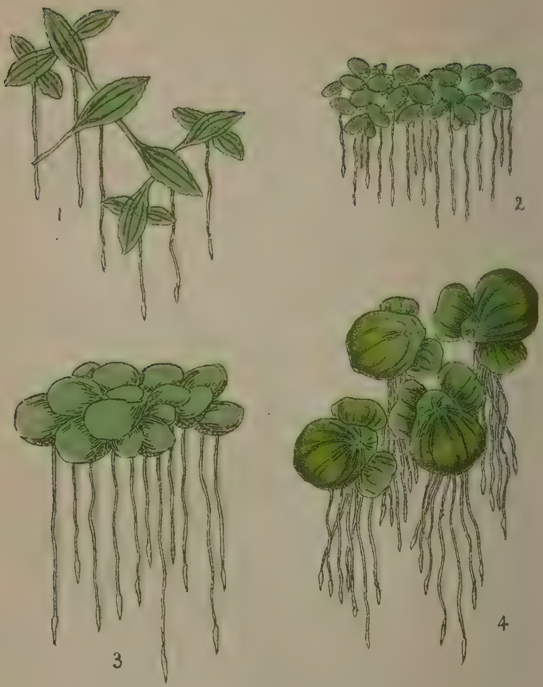
I. Water Germander (*T. scordium*). A stinking perennial (1 to 2 feet high) that affects wet meadows, chiefly in the Eastern counties, with stalkless oblong leaves, coarsely toothed, woolly. Corolla ½ inch, rosy, with spotted lip. July and August. Very rare.



Wood Sage.

Teucrium scorodonia.

LABIATÆ.



Duckweeds.

1. Lemna trisulca. 2. Lemna minor.
3. ,, gibba. 4. ,, polyrhiza.

LEMNACEÆ.

II. Annual Germander (*T. botrys*). Stem branched, erect, 8 inches high. Leaves stalked, pinnately lobed. Calyx large, inflated after flowering. Corolla ⅔ inch, rosy purple, lip spotted with white and red. July and August. Exceedingly local. Selsdon, Box Hill, and Bookham in Surrey; Upper Halling, Kent.

III. Wall Germander (*T. chamædrys*) is a garden escape, found rarely on old walls. Perennial. Stem 6 to 8 inches, with woody base. Leaves gradually narrowing into the footstalk. Bracts stalkless, leaf-like. Corolla ¾ inch, rosy purple, lip spotted with white and red. Flowers July to September.

The name of the genus is the old Greek appellation for the plant, dedicated to Teucer of Trojan War celebrity.

Duckweeds (*Lemna*).

The Duckweeds—Shakespeare's "Green mantle of the standing pool"—are plants that are well known to everybody, and consequently very few persons know anything of them. This is a paradox; but they are so common and so small that the average man or woman is content to know them in the aggregate, and cannot condescend to a more intimate acquaintance with individuals, or with the different species, yet, like many other small things—"unconsidered trifles"—they are very interesting to the botanist; for these are among the smallest and simplest of the flowering plants. Taking up two or three plants from one pond, and comparing them with some from another piece of water, we shall probably find a difference in them; but they are all possessed of a more or less flattened green body that floats on the water, and which we shall be inclined to call a leaf. It is not a leaf, however, but a plant that produces no leaves, though it has roots and flowers. To be more accurate, we will call it a frond, from whose under-surface there goes down one or more simple unbranched roots, and in clefts of whose margin are simple flowers. The flower consists of an envelope or spathe, within which is a bottle-shaped pistil, with one or two stamens beside it. Some authorities contend that the pistil and each of the stamens is really a distinct flower similar to those in *Arum*. These flowers are so minute that they are rarely seen, and so the plant is thought to flower only occasionally. It is chiefly multiplied by the production of new fronds from its edges. Though generally considered as annuals, they are not strictly so in the sense of a plant that has to be renewed from seed each year. In autumn the material of the frond is packed into heavy bulbils, which sink to the bottom of the pond, and there remain until spring, when they rise to the surface and begin budding afresh. The four species figured give the whole of the genus, so far as Britain is concerned; but three others are known in foreign waters. The differences in the natives may be thus briefly enumerated :—

I. Least Duckweed (*Lemna minor*). The most frequent species Frond not more than ¼ inch long, egg-shaped, the top flat and bright green, underside very pale green and slightly convex, with a single root. Spathe two-lipped, one much larger than the other. Stamens two, one maturing before the other; style long. Flowering in July.

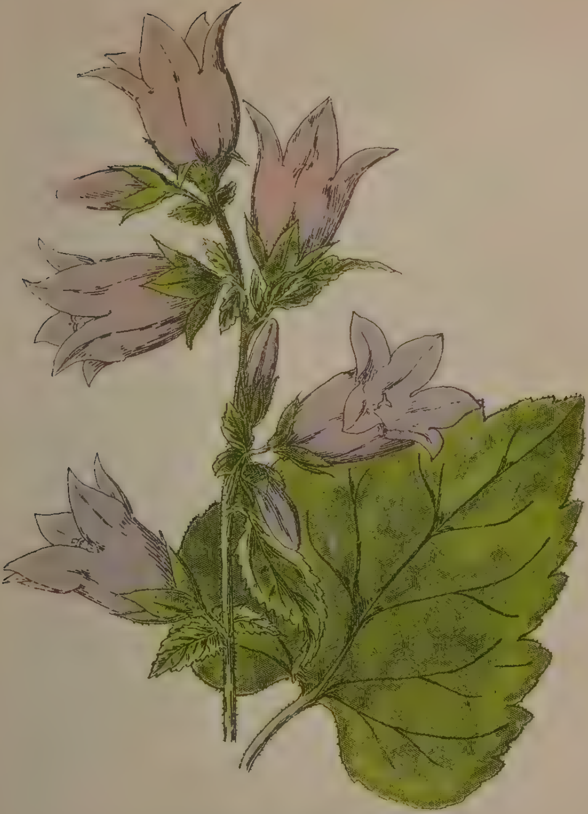
II. Ivy-leaved Duckweed (*L. trisulca*). Frond thin and flat, nearly an inch long, tailed at one end, coarsely toothed at the other. New fronds emerge at right angles to the parent. Roots solitary. Stamens two; style short. June and July.

III. Thick-leaved Duckweed (*L. gibba*). Frond nearly round, narrowed at one end, large, almost flat, green, opaque on top, greatly swollen beneath, whitish, clear, the cell-structure being very noticeable. Root solitary, stamens two. Flowers June to September.

IV. Great Duckweed (*L. polyrhiza*). At once distinguished from the others by its *bunch* of roots from each frond. Upper surface slightly convex, dark green with seven nerves. Underside purple, as also the upper margins. Stamens two. Flower has been rarely seen in this country.

The name of the genus is the old Greek appellation of the plant, *Lemna*, supposed to be derived from *Lepis*, a scale.

There is an allied plant, *Wolffia arrhiza*, which has the distinction of being the smallest flowering plant known to science. Its frond, which is without roots, measures $\frac{1}{20}$ by $\frac{1}{40}$ of an inch, flattened above, producing new fronds singly at the base of the old, which soon become separate. The flowers emerge from the upper side of the frond, but they have not been found in this country—nor indeed in Europe. Its discovery as a British plant occurred so recently as 1868, when Mr. H. Trimen found it in a Middlesex pond. Since then the energy of London botanists has established the fact that it occurs all round the Metropolis. It is usually described as "like a grain of sand," and green.



Nettle-leaved Bellflower.
Campanula trachelium.
CAMPANULACEÆ.

2 *Pl.* 40

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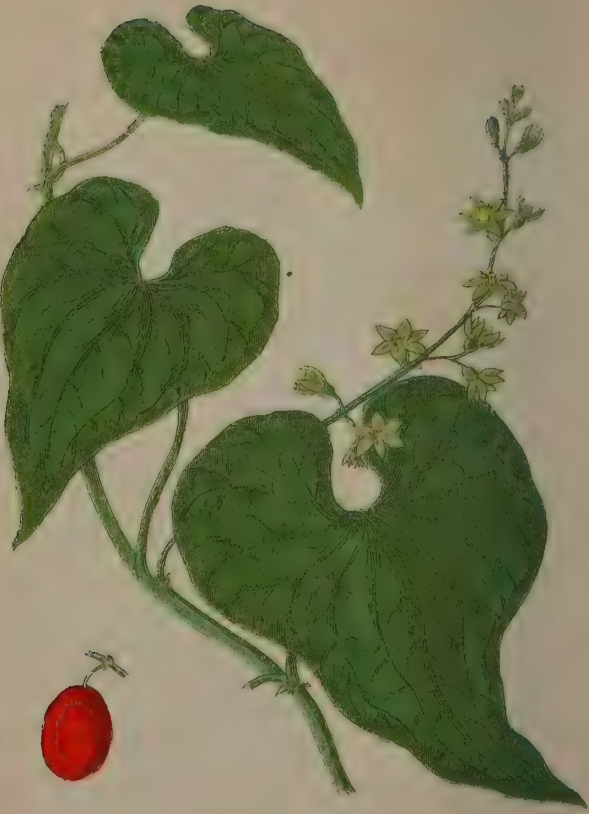


Black Bryony.
Tamus communis
DIOSCOREACEÆ.

Nettle-leaved Bell-flower (*Campanula trachelium*).

In hillside woods and copses, and along lanes where the hedge-trimmer is not too conscientious, this fine plant may be found in all its beauty; but too frequently one finds that the hedger's hook has lopped off the panicle and left only the lower part of the plant. Even then an effort is made for the perpetuation of the species by throwing out side branches from the axils of the stem-leaves, but the dignity and chief beauty of the plant is gone. The Nettle-leaved Bell-flower appears to be the real original Canterbury Bell, but in modern times the gardener has bestowed the name upon an allied species of alien origin. Throatwort is another old English name for it. Gerarde, in his Herball mentions these and other names in the following passage:—"Throtewort is called in Latin Cervicaria, and Cervicaria major; in Dutch, Halsecruyt; in English, Canterbury Bells, Haskewoorte, Throtewoorte, or Houlawoort, of the virtue it hath against the pain and swelling thereof."

Of the general character of the Bell-flower family we have spoken in connection with Harebell (page 21). The Nettle-leaved species is a perennial herb with a stout short rootstock, from which arise large heart-shaped leaves on long stalks, coarsely toothed, and bristly. The stem-leaves become less heart-shaped, more slender, and shortly stalked the farther they are from the roots; but the aspect of the leafy stem before the flowers appear is very Nettle-like, and no doubt this is a character assumed by the plant for its protection. The stem is 3 or 4 feet long, angled and bristly, the upper half bearing many small racemes of more or less erect blue-purple bells, which are ¾ inch across. The upper bud in each raceme opens first, the others in succession; by this plan the entire panicle is kept well covered with open flowers until the end. The flowers may be found from August to October throughout the country, but chiefly in the south.

The two other native species of Bell-flower are of similar character:—

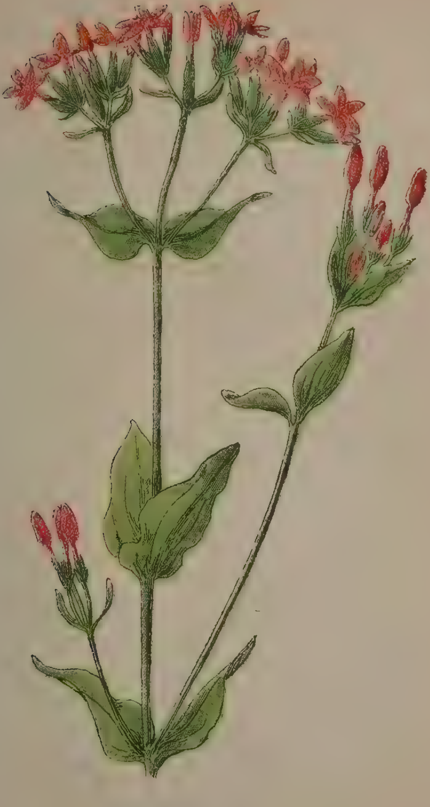
I. Giant Bell-flower (*C. latifolia*). Much like Nettle-leaved Bell-flower, but with stouter furrowed and downy stem. The root-leaves are stalked, triangular-heart-shaped, and hairy; the stem-leaves without stalks, broadly-oval, bluntly-toothed. The large blue (or white) flowers are here in a single raceme (not a panicle of racemes), each branch supporting one flower only, and the raceme is more leafy. It flowers in July and August, and is more abundant in the north; its southern limits are Gloucestershire and Surrey.

II. Clustered Bell-flower (*C. glomerata*) is a downy plant less than 2 feet high, with a rounded, leafy, slender stem. The root-leaves are heart-shaped on long stalks; the stem-leaves stalkless, clasping the stems. The purple-blue flowers are erect, mostly crowded in a terminal head. On dry soils, chiefly chalk, from Somerset and Kent to Forfar; September and October.

Black Bryony (*Tamus communis*).

There is no connection between this plant and the White Bryony described in First Series, page 114; but they have this peculiarity, as well as a name in common—that each is the solitary British representative of an important Natural Order. *Tamus* alone in Europe sets forth the structure of the great Yam family, of such importance in the tropics.

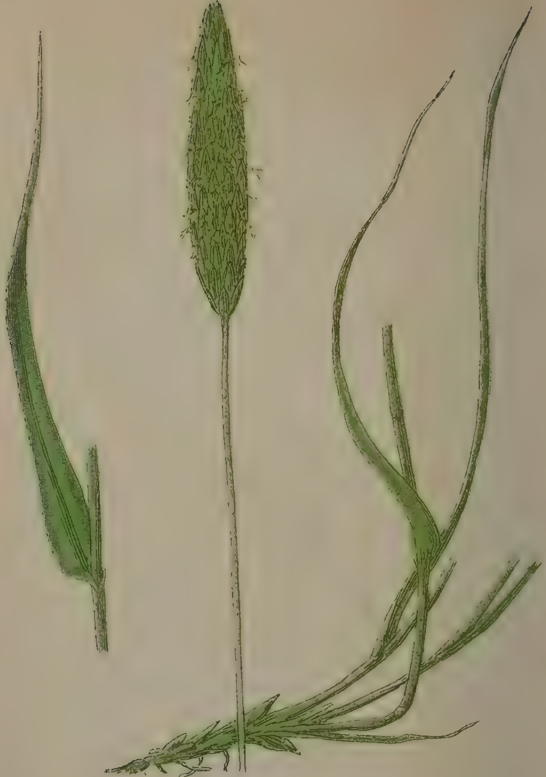
The climbing habit of the two species is very different: *Bryonia* rising in the world by means of long, branched, spiral tendrils, whilst *Tamus* is without such aids, and climbs by twining, in the same fashion as the Honeysuckle and the Bindweeds. *Tamus* has a large, underground, fleshy rootstock, black on the outside. Its long, angular stem ascends to a considerable height, its spirals coiled "with the sun," *i.e.* from right to left. The leaves are fine, large, heart-shaped, with entire edges and shiny surface, 4 inches long, on long stalks; green, but turning in early autumn to a fine bronze. The yellow-green flowers of each sex are very small, and produced by different plants, which are therefore called *diœcious*. The males are in slender, branched sprays from the axils of the leaves; the females are in shorter, curved sprays.



Centaury.
Erythræa centaurium.
GENTIANACEÆ.

2 *Pl.* 42

D 48



Meadow Foxtail Grass.
Alopecurus pratensis.
GRAMINEÆ.

The male flower consists of a six-parted perianth, with as many stamens attached; whilst the female flower contains a three-celled ovary with three styles, the stigmas lobed. The fruit is a soft, oblong berry, that becomes bright red when ripe. It flowers in May and June, and is common in hedge and copse, but must not be sought north of Cumberland, nor in Ireland. The plant figured in our plate is the male; we also give a sample berry of the natural size.

The roots are rich in an acrid juice, and were formerly cut in slices to serve as stimulating plasters. We believe they are still used to take away the discoloration from "black eyes" and other bruises. The etymology of the name is involved in obscurity, or at least the explanations given are by no means satisfactory.

Centaury (*Erythræa centaurium*).

A very neat and beautiful plant, not nearly so well known as it should be. It is an annual, with square erect stem, less than a foot in height, the oblong leaves in pairs growing together at their bases, and the funnel-shaped pink flowers produced in terminal cymes. It grows in woods and sandy or chalky pastures, flowering from June till September.

There are several forms, differing somewhat from the type, and regarded by some authorities as distinct species under the following names:—

I. Dwarf-branched Centaury (*Erythræa pulchella*). Shorter, usually much branched from the base; leaves broader, egg-shaped; flowers stalked, calyx almost as long as the corolla tube. July to October.

II. Broad-leaved Centaury (*E. latifolia*). Stem stout, 2 or 3 inches high, branched from base; leaves broadly elliptical, with prominent ribs, flowers not stalked, in a crowded cluster. June and July, near the sea.

an Croiḋe Ró

III. Dwarf-tufted Centaury (*E. linarifolia*). Stem 2 to 6 inches, simple or branched; leaves narrow-oblong, ribbed; flowers stalkless in a dense terminal cluster; calyx as long as corolla tube. Sandy shores, June to August.

The name is from the Greek, *Eruthros*, red, in allusion to the pink flowers.

Meadow Foxtail Grass (*Alopecurus pratensis*).

The Meadow Foxtail (*Alopecurus pratensis*) bears a general resemblance to Timothy (page 20) to which it is not very distantly allied; but from which it differs in having no *palea* or scales. Its cylindrical panicle is yellowish-green, with silvery hairs, the branches bearing three to six spikelets. It is a perennial plant, and produces runners. It forms a valuable portion of all good pastures, the herbage being exceedingly nutritive. It flowers in May and June. The name is Greek, signifying Foxtail. There are three other native species in the genus:—

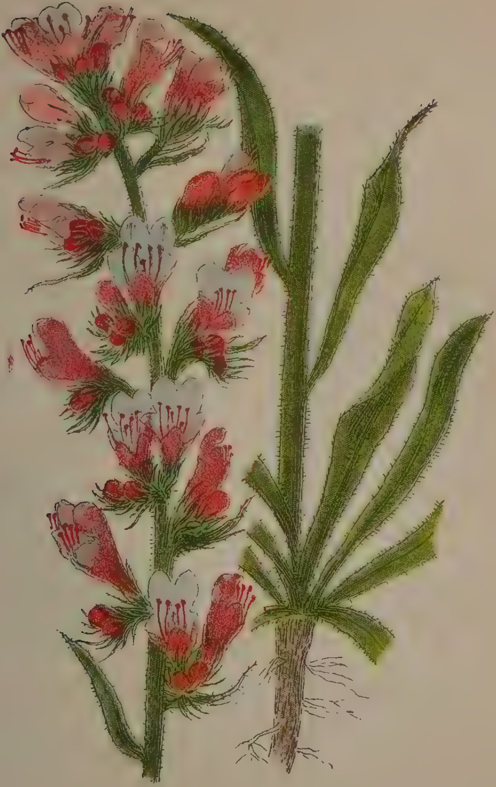
I. Slender Foxtail or Black Grass (*A. agrestis*). *Annual.* Panicle slender, often purplish, branches hairy, with two spikelets. A wayside weed. May to October.

II. Alpine Foxtail (*A. alpinus*). Perennial. Panicle ovate, short, ¾ inch, branches with four to six spikelets. Anthers yellow. Rare, near alpine streams, from 2100 to 3600 feet. Scotland. July and August.

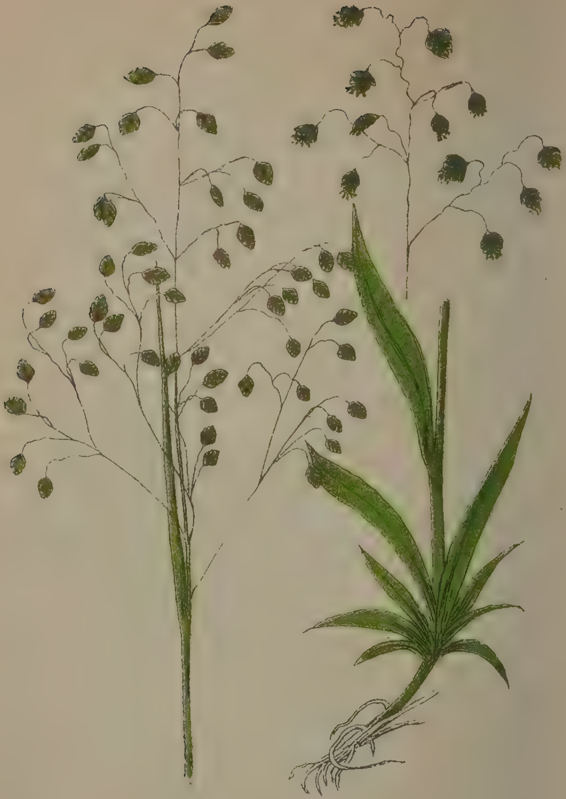
III. Floating Foxtail (*A. geniculatus*). Perennial. Stems, procumbent and rooting. Panicle dense, slender. Branches with one spikelet. Anthers purplish. Pools and wet places. May to August. A sub-species of this (*A. bulbosus*) occurs rarely in southern salt marshes, and has the lowest knots on the stem enlarged into oval tubers.

Viper's Bugloss (*Echium vulgare*).

A very stately plant is the Viper's Bugloss, whose unbranched stem attains a height of 3 feet, its upper part a panicle of red and blue flowers in short cymes. To our mind the plant is prettiest when only one or two flowers are open on each cyme—as illustrated by our artist. The recurved cymes are then



Viper's Bugloss.
Echium vulgare.
BORAGINACEÆ.



Quake-grass.
Briza media.
GRAMINEÆ.

very short, and the unopened flowers packed closely together. After flowering, the cymes lengthen, and the aspect of the plant changes. The unopened corollas are purplish-red in colour, when opened bright blue. The parts of the flower, it will be seen, are in fives: calyx five-parted, tubular corolla with five-lobed "limb," as the free portion is called, stamens five, stigma two-lobed. The lobes of the corolla are unequal, and one of the stamens is shorter than the other four, which protrude from the corolla considerably; in fact, they serve as a platform upon which insects alight. When the flower opens the anthers are ripe and shed their pollen, so that bees or other insects alighting are sure to get their under surface dusted with it. At this period the pistil is short and immature, so that it cannot be fertilized by its own pollen; but as the pollen disappears the pistil lengthens, until its stigmas are in the position where they are bound to receive pollen brought on the under surface of a visiting insect. The leaves are strap-shaped, narrowed to the base, long, and rough with stiff hairs, as, indeed, is the whole plant.

Much fault is found with scientific names on account of their uncouthness and obscurity. But they are mostly derived from Greek and Latin roots, and reflect some peculiarity of the plant; whereas many of the English or Folk-names are most arbitrary, and require much explaining, which is sometimes not easily done. "Viper's Bugloss" is a puzzle, and authors have pretended to see likenesses to a viper in the markings of the stem, the shape of the flower and of the seeds; others have taken shelter behind Dioscorides, who said that a decoction of the plant was a protection from the effects of a viper's bite. If a man knew he was going to be bitten by a viper and took a certain dose of this plant beforehand he was all right! But the word bugloss seems a worse puzzle than the plant's connection with vipers. Most dictionaries will help to the extent of telling that bugloss is the name of a plant, and no more.

The truth is, it is as Greek as any scientific name, being compounded of the words *Bous*, an ox, and *glossa*, a tongue, from its leaves being rough, like the tongue of an ox.

It is sometimes annual, sometimes biennial, common on gravelly and chalky soils, and flowering from June to August. It is rich in honey, so that it is much frequented of sweet-tongued insects, and the quiet wanderer on the hills who comes upon a sunny patch of Viper's Bugloss may have the delight of seeing the Humming Bird Hawk-moth (*Macroglossa stellatarum*) poised on rapidly vibrating wings whilst it inserts its long tongue and drinks without alighting. The name *Echium* is from the Greek *Echis*, a viper.

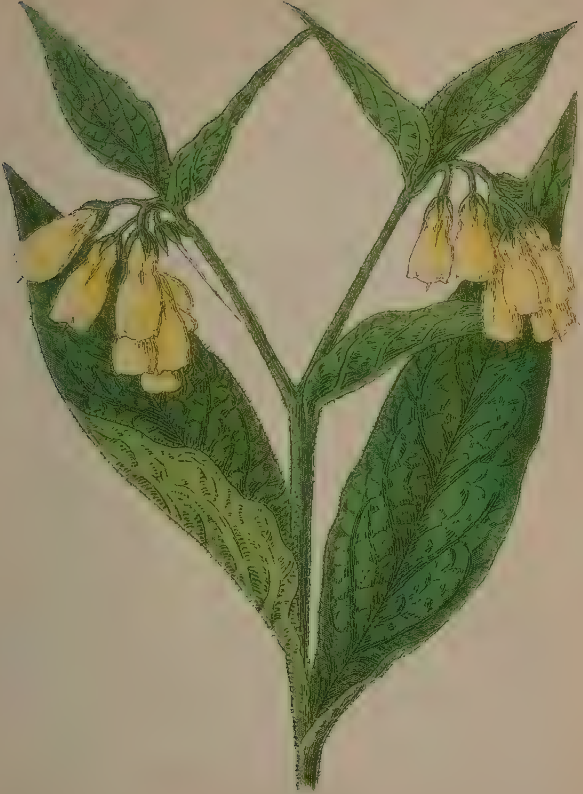
There is one other British species :—

Plantain-leaved Viper's Bugloss (*E. plantagineum*), which has a *branching* stem, and oblong leaves broader at base where they partially clasp the stem. The flowers are larger, of a dark blue-purple colour, in *long, spreading* cymes. It is found at the Land's End, and in Jersey.

Quake or Totter-grass (*Briza media*).

The Totter-grass, or Wag Wanton, differs so strongly in appearance from other grasses that minute description is unnecessary except as an aid in making out the structure. Every child that plays in the meadow singles this out as the most desirable acquisition among grasses, because of its constant tremblings. The inflorescence is a very loose pyramidal panicle, due to the extremely long and hair-like stalks upon which the shining purple spikelets are swung. The empty glumes are two; flowering glumes six to eight. The stem creeps below the surface, and the leaves are flat. The plant is perennial.

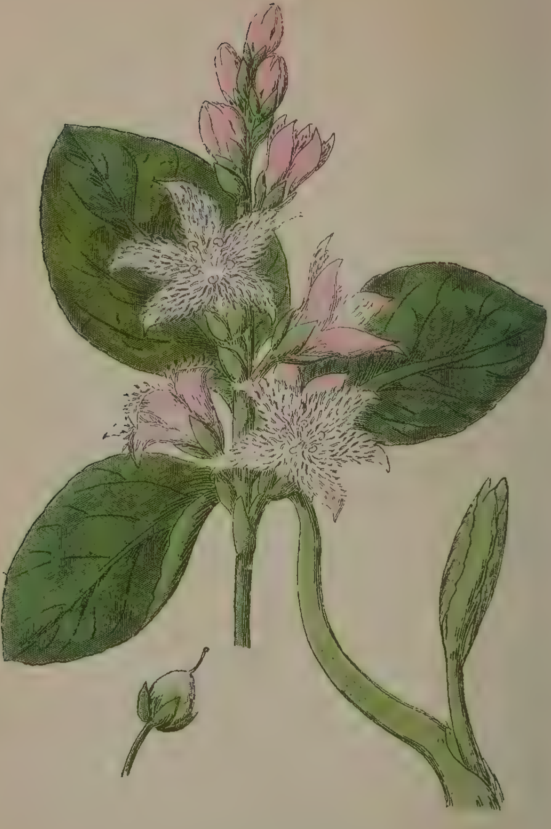
There is another species, the small Quake-grass (*B. minor*), that is annual. This is not so common a plant, and is found chiefly in sandy fields between Cornwall and Hampshire; also in the neighbourhood of Cork and in the Channel Islands. It



Comfrey.

Symphytum officinale.

BORAGINACEÆ.



Buckbean.
Menyanthes trifoliata.
GENTIANACEÆ.

is much smaller than *B. media*, and has tufted stems; it flowers in July, *media* a month earlier. A third species (*B. maxima*) with few very large spikelets has become naturalized in Guernsey.

The name *Briza* is Greek, and was anciently applied to some kind of corn.

Common Comfrey (*Symphytum officinale*).

Often in May and June, as we wander by the riverbank or brookside, we shall happen upon this very coarse but striking plant, though its flowers may not be of the hue depicted here; its colour varies from pale yellow to red and purple. It is one of those plants whose individuality is so strong that, once seen, it will not be forgotten or confused with any other species. It has a branched rootstock, giving off stalked leaves, and an erect angular stem. The upper leaves are all but stalkless, their bases running down the stem in such a manner as to give it a winged character. The whole plant is rough with bristles. The genus belongs to the order Boraginaceæ, and the present inflorescence may be noted as a capital example of the "scorpioid cyme," so called from its curve resembling the curl in a scorpion's tail!

There is another British species, the Tuberous Comfrey (*S. tuberosum*), which is usually found in wet copses, but not south of Bedford. It is in all respects smaller, and not nearly so rough, as its congener, although distinctly hairy. The rootstock is thicker, and the radical leaves have longer stalks than in *S. officinale*. The stem-leaves do not run far down the stem, so that it is not so obviously winged, and the flowers are smaller. Pale yellow. June and July.

The name is derived from the Greek *sumphuo*, to unite, it having great reputation formerly as a woundwort.

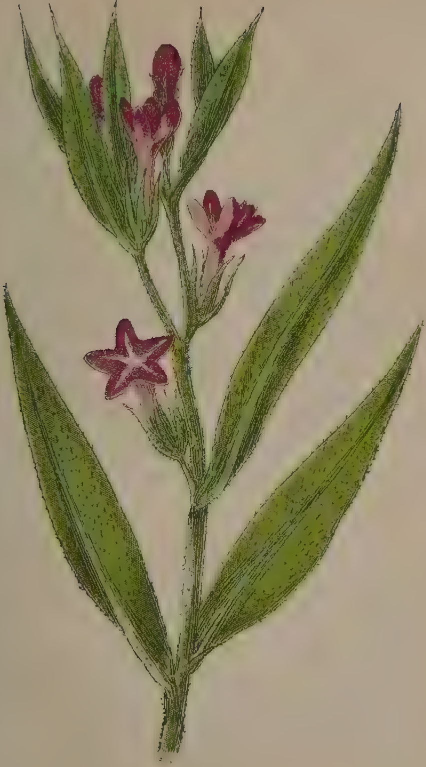
Buckbean (*Menyanthes trifoliata*).

It is well worth while for the flower-lover to go properly equipped to some boggy valley with well-greased boots that will enable him to walk on the oozy ground without fear of wet feet. There he will find a host of singular and beautiful plants that, according to ordinary notions, would seem to be out of place in unpleasant spots. The Buckbean, Beckbean, Bogbean, or Marsh Trefoil, is one of these bog plants, and there are few more beautiful ones in the whole of our native flora. It has a thick creeping rootstock, from which the leaves are given off alternately, the broad bases of their stalks clasping the rootstock. Each leaf is broken up into three smooth, oval leaflets which gives the plant some resemblance to the Broad-bean, and has suggested the "bean" and trefoil elements in its names. The flower-spike bears a number (three to twelve) of beautiful blossoms, with five-parted calyx, and a funnel-shaped corolla with five lobes which are curved outwardly. Externally the corolla is pinkish, but within it is pure white, covered with white fleshy filaments. The five stamens are attached to the corolla-tube, and are very distinct on account of their reddish colour. There are long-styled and short-styled forms of the flower, as in the Primroses, etc. The plant is very easily cultivated ; but is best appreciated when one alights upon a lonesome bog-fringed tarn in a wooded valley during its flowering time—May to July. There one may find the Buckbean rootstocks forming a matted raft stretching half across the tarn, their smooth trefoils shining, and setting off the pure whiteness of hundreds of flower-spikes. Such a sight will not readily be forgotten by the flower-lover.

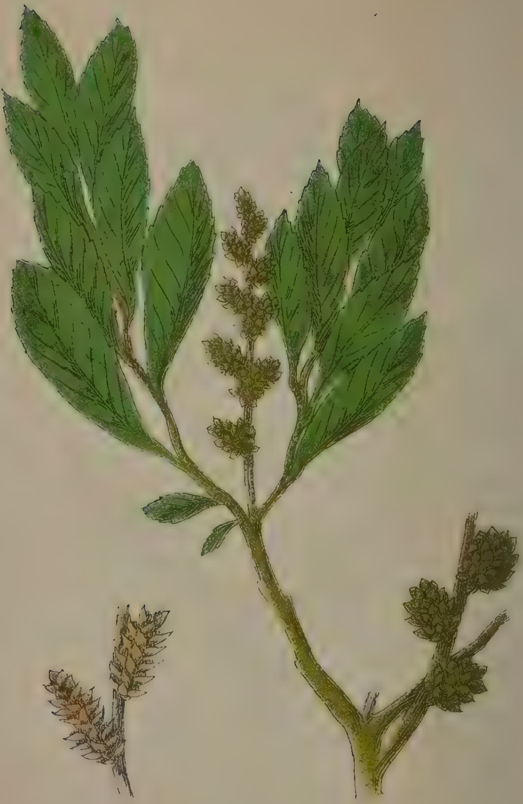
Like all the members of the Gentian family, *Menyanthes* possesses bitter tonic properties, which caused the plant to be formerly used in medicine, in brewing, etc. *M. trifoliata* is the only British species.

Gromwell (*Lithospermum purpureo-cœruleum*).

In violation of our plan of selecting a common species as the representative of a genus, we have here deliberately chosen a



Gromwell.
Lithospermum purpureo-cœruleum.
BORAGINACEÆ.



Bog Myrtle.
Myrica gale.
MYRICACEÆ.

rare one, solely on account of its colour: the others being yellowish-white scarcely need a colour-plate to depict them. The Gromwells, like most of the other members of the Borage family, are bristly plants, of which the Comfrey, already described, may be taken as a type.

The Purple Gromwell (*Lithospermum purpureo-cœruleum*) is a rare perennial, whose range is restricted to chalk and limestone soils from Devon to Kent, and in Wales. It has a woody, creeping rootstock, and creeping stems about 1 foot in length; these do not produce flowers. The flowering stems are about twice the length of the barren ones, and erect. The slender lance-shaped leaves are scarcely stalked, and are covered with soft bristles which have a bulbous base and lie close to the leaf-surface. The flowers are in few-flowered cymes with large leafy bracts, and have very short stalks. The bright blue-purple corolla is salver-shaped with five lobes and five downy folds at the mouth of the tube. It measures ¾ inch across. The fruit consists of one or two hard white nutlets, of almost globular form. The flowers appear in June and July.

There are two other British species in the genus:—

I. Common Gromwell (*L. officinale*). A perennial with stout woody whitish rootstock, from which arise several erect branching rough stems, to a height of 2 or 3 feet. The leaves, which are stalkless and partially clasp the stem, are narrow-lance-shaped, downy above, and covered with tuberous bristles beneath. The flowers, which are only one-third of the diameter of those of the Purple Gromwell, are greenish-yellow, with a crown of scales in the throat of the corolla; June and July. There are two or three polished grey nutlets which are broader at their base. There are no barren stems in this species, which extends north as far as Ross-shire, and also occurs in Ireland, in copses and hedgerows.

II. Corn Gromwell (*L. arvense*). Annual, with a solitary bristly stem, growing erect (though not straight), and branched. Root bright red. Root-leaves broad-lance-shaped, stalked, bristly on both sides; stem-leaves narrow-oblong, stalkless, half clasping the stem. Flowers same size as Common Gromwell, but creamy-white, with folds in the throat as in the purple species; May and June. Nutlets, three or four, pale brown, polished and pitted, narrowed upwards. Distribution similar to that of Common Gromwell, but in cornfields and wastes.

The name of the genus is compounded of the Greek words *lithos*, stone, and *sperma*, seed, in allusion to the hard fruits.

Bog Myrtle (*Myrica gale*).

Sweet Gale, Dutch Myrtle, and Candle-berry Myrtle are other names for the plant represented on Plate 49. It is a shrub which grows from 3 to 4 feet high, and delights in bogs and damp moors. It forms thick bushes, and in places—as parts of the New Forest and the Fens—these are continuous over considerable areas. The leaves are lance-shaped, with the broadest part uppermost, shortly stalked, and toothed. They are yellow-green in colour, alternate on the branches, and downy beneath, dotted with glands which secrete a wax which gives off a pleasant fragrance under the sun's influence, or when passed through the hands. The flowers have neither calyx nor corolla; they are gathered in a kind of catkin, with mere scale-like, concave bracts, the sexes on separate spikes, usually on different plants. The male spikes—shown separately on the Plate—are about an inch in length, erect, and crowded; the stamens usually four to each bract, the anthers red. The female spikes are only $\frac{1}{4}$ inch long; the ovaries one-celled with two bracts, two thread-like styles that are stigmatic all over, and of a red colour to match the anthers. The fruits are of the kind called *drupes;* that is, like a cherry or plum, with a fleshy outside and a bony inside. Popularly they are berries, and they get their name of Candle-berries from the fact that they are coated with waxy resin. They are boiled in water, and the wax, of course, floats to the top, to be skimmed off and made into small candles, which in burning give off an aromatic odour. In some parts they are used as spices. The leaves contain a bitter principle, and are said to be used in lieu of hops for Highland brewing, following an ancient practice in Northern Europe. Nitrifying bacteria form nodules on the roots.

This is the only British species; it flowers from May to July. The name is from *murike*, the Greek name for the Tamarisk.

Oblong Pond-weed (*Potamogeton polygonifolius*).

We have pond-weeds in abundance, but the Potamogetons are the pond-weeds *par excellence*. There is scarcely a piece of water in this country, be it river, lake, pond, canal, or intermittently dry ditch, but has one or more species growing there. The genus is a very difficult one, such as it is impossible to do much more than show the general characters of here. Hooker and Bennett, in their revision of the genus, give twenty-one British species with a number of connecting sub-species and varieties. Dr. Alfred Fryer, who has made a special study of the genus, and is the author of a magnificent monograph upon the British species, has extended the list. The one figured here is the Oblong Pond-weed (*P. polygonifolius*), with narrowly egg-shaped floating leaves, and narrower submerged leaves. All have long leaf-stalks. The floating leaves always present the upper side to the air, and are always perfectly dry. The flowers are greenish and unattractive, collected into a slender spike. Individually they consist of a four-parted perianth, with four stamens and four carpels. There is a species (*P. natans*) with broader floating leaves and narrow submerged leaves. A broader still is *P. plantagineus*, with clearer leaves and more slender leaf-stalks. *P. crispus*, *P. densus*, *P. perfoliatus*, *P. prælongus*, etc., have only submerged leaves, which are more or less oblong.

The species with floating leaves form refuges for many interesting low forms of life, and the microscopist will find them very fruitful in specimens for him. The more generally distributed species are briefly described below. Most of them flower between June and September.

The name is from the Greek words, *potamos*, a river, and *geiton*, a neighbour.

1. Broad-leaved Pond-weed (*P. natans*). Floating leaves leathery, elliptic or

lance-shaped, on long stalks and with long stipules. Flower-spike dense on a stout stalk.

II. Plantain-leaved Pond-weed (*P. plantagineus*). Leaves all transparent, elliptic or oblong, on short stalks with short, broad stipules. Stems creeping below, sometimes sending out runners. Stagnant waters, mostly on peaty soils.

III. Reddish Pond-weed (*P. rufescens*). Floating leaves rather leathery, but translucent, lance-shaped, on short stalks. Often tinged with purple or red. Flowering-spike stout; July to September. Ponds and ditches.

IV. Various-leaved Pond-weed (*P. heterophyllus*). Floating leaves elliptical; thin, but somewhat leathery; sometimes absent. Submerged leaves slender-lance-shaped, limp, and stalkless. Lakes and pools.

V. Shining Pond-weed (*P. lucens*). All the leaves translucent, lance-shaped, with very short stalks; variable, with very small teeth near the base; mostly submerged. Spike stout and dense-flowered. Lakes, ponds, and streams.

VI. Perfoliate Pond-weed (*P. perfoliatus*). Leaves clasping the stem, heart-shaped or lance-shaped, pellucid; all submerged. Spike dense-flowered. Lakes, ponds, and streams.

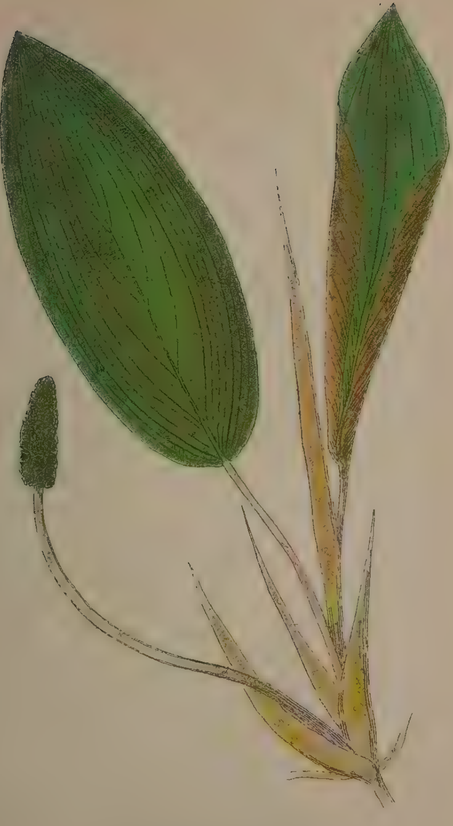
VII. Curled Pond-weed (*P. crispus*). Leaves all submerged, in two rows, narrow-oblong, wavy, edges crisped and fine-toothed. Spikes few-flowered, flowers small; July and August. Ponds and ditches.

VIII. Close-leaved Pond-weed (*P. densus*). Leaves heart-shaped, opposite, in two close ranks, their bases overlapping; translucent and finely-toothed. Spike four-flowered. Ponds and streams; July to September.

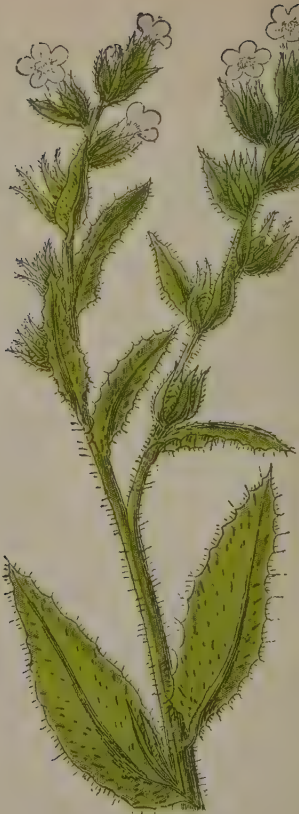
IX. Small Pond-weed (*P. pusillus*). Stem thread-like. Leaves very narrow, thin, but rather opaque, half-clasping the stem, one to three-nerved. Spike few-flowered. Rivers and ponds; July and August.

Bugloss (*Anchusa arvensis*).

The Common Bugloss must not be confounded with the Viper's Bugloss (*Echium*, *see* page 50), owing to the similarity of the popular names; the plants will never be confounded when once seen, though they have certain characters in common, both plants belonging to the order Boraginaceæ. Bugloss is an exceedingly bristly—one might almost say prickly—annual, frequent about cultivated fields, upon a light soil. It grows to a height of little more than a foot, the rough stems rising from a tap-root, from which also grow several stalked leaves, lance-shaped and thickly covered with sharp bristles, as, indeed, is the case with the whole of the plant with the exception of the corolla alone. Each bristle arises from a scaly tuberous base. The



Oblong Pond-weed.
Potamogeton polygonifolius.
NAIADACEÆ.



Bugloss.
Anchusa arvensis.
BORAGINACEÆ.

stem-leaves are stalkless (*sessile*), oblong, and narrow, and partially clasping the stem. The flowers are in cymes with leafy bracts, almost stalkless. The calyx is five-parted; the corolla tubular, *distinctly curved*, with five spreading lobes, ¼ inch in diameter, and of a brilliant blue colour. The mouth of the tube is closed by five convex, white, hairy scales, one at the base of each lobe. The five stamens are attached to the tube lower down. The four-celled ovary at the bottom of the tube develops into four nutlets. It flowers in June and July. Sometimes referred to the genus *Lycopsis*.

There are two other species found in this country, but they are not natives—only long-established settlers. They are:—

I. Common Alkanet (*A. officinalis*), with softer bristles, and stout biennial root. Leaves narrow lance-shaped. Stem 1 to 2 feet. *Corolla tube straight.* Corolla deep purple, ½ inch across, with white scales. April to June. Rare.

II. Evergreen Alkanet (*A. sempervirens*). Perennial. With broad oval leaves, those of the stems with short stalks, those from the root with long stalks. Flowers on short footstalks, bright blue, ⅜ inch across, scales white, tube straight. May and June. Rare, but more widely distributed than *officinalis*.

A closely related plant, the Borage (*Borago officinalis*), is well known as a garden plant, and it may be frequently found growing wild in waste places near habitations. It is not considered a native. Like Bugloss it is covered with tuberous-based bristles. It may be either annual or biennial. The lower leaves are oval-lance-shaped, stalked; the upper narrower, stalkless, but narrowed to the base where there are ears. The bright blue flowers are wheel-shaped, ¾ inch across, grouped in few-flowered cymes. The purple-black anthers, protruding far from the corolla, afford an effective contrast to the blue of the corolla. It flowers in June and July.

Eyebright (*Euphrasia officinalis*).

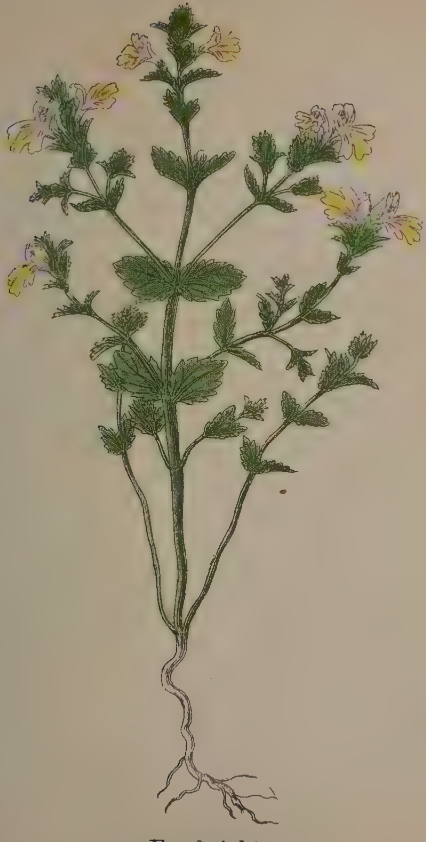
From the close-cropped turf of our commons and meadows the bright eyes of this plant peep out through the summer. In such situations it is a very lowly herb, only an inch or so in height, but in some places, as in the pastures of the Highlands, it grows erect to a height of nearly a foot, with many opposite branches. The leaves are ovate, opposite, without stalks, and of a dark green hue. The flowers are borne near the extremities of the branches. On some plants the flowers are much larger than on others, and in the larger the stigmas ripen before the anthers ; in the smaller the anthers mature before the stigmas. The tubular calyx is divided into four sharp lobes. The corolla is white, streaked with purple, except the central lobe of the lower lip, which is yellow. This is the only native species of the genus—which is comprised in the order Scrophularineæ—though there are several varietal forms which specialists declare to be separate species. It flowers from May to September. The name is from the Greek, *Euphraino*, to delight or gladden, in allusion to the pleasing contrast of its bright flowers with the dark foliage, or from its supposed efficacy for complaints affecting the eyes—its removal of these ailments giving gladness.

The plant is—at least partially—a parasite, and preys upon the roots of other plants, which it robs. Probably the lowly forms to which we have referred may be less parasitic than those of greater stature ; for if the seeds are sown in pots by themselves they will germinate and grow, but will never get large robust plants.

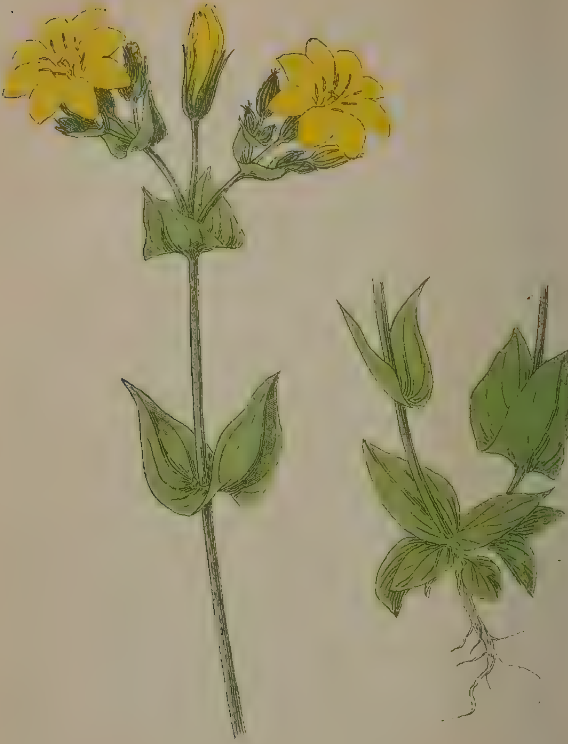
Mr. Frederick Townsend, M.A., F.L.S., has devoted much attention to elucidating the various forms of Eyebright, and as the result of his labours has published "A Monograph of the British Species of Euphrasia" (*Journal of Botany*, 1897), in which he gives fourteen species as being lumped together under the name of *Euphrasia officinalis*. Others declare that thirteen varieties have been separated from the typical form and given specific names, but that they still remain varieties only.

Yellow-wort (*Blackstonia perfoliata*).

In some places the Yellow-wort is the Yellow Centaury, and, in truth, it has something of the primness of its not very distant relation *the* Centaury (*Erythræa, see* page 49). It is a smooth annual plant that grows upon downs, heaths, and banks, on



Eye-bright.
Euphrasia officinalis.
SCROPHULARIACEÆ.



Yellow-wort.
Blackstonia perfoliata.
GENTIANACEÆ.

chalk and clay, southward of Westmoreland and Durham, and in some places is very abundant. With the exception of the delicately tinted yellow flowers, the whole plant is of the peculiar glaucous hue. The somewhat spoon-shaped radical leaves form a rosette round the base of the very erect round stem, upon which there are few leaves, but these stem-leaves are in pairs with their bases joined, so that they completely surround the stem, and make it difficult for crawling insects to climb the smooth stems to reach the flowers. This encircling of the stem makes it *perfoliate*, and the leaves themselves in this amalgamated state are said to be *connate.*

Yellow-wort belongs to the order Gentianaceæ, but its flower-parts very readily distinguish it from other Gentian-worts, as we shall see on comparing it with Centaury, Felwort, and Buckbean. In these the flower-parts are in fours or fives, but in Yellow-wort they are in eights (sometimes six). The calyx consists of eight slender, lance-shaped sepals, with awl-shaped points ; the corolla is *rotate*, consisting of a short broad tube, with eight bright yellow lobes. The ovary, with its style and cloven stigma, is bottle-shaped as a whole, but after fertilization the style drops off. When the flower first opens the stigmas are ready to receive pollen brought by any insect visitor, but the anthers do not shed their pollen until later, when probably cross-fertilization has been effected. The corolla would be described as *persistent*, because it keeps its hold until ruptured by the expansion of the seed-vessel. It flowers from June to September, remaining open only in sunshine.

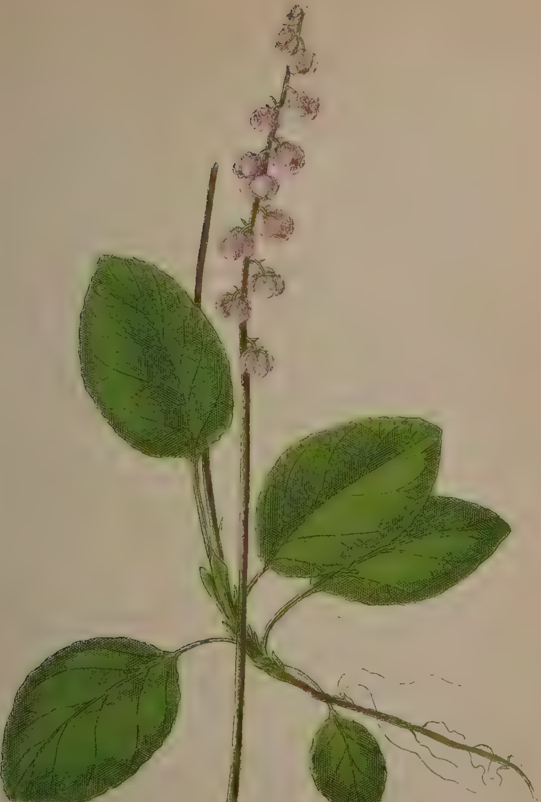
The name *Chlora*, given to this genus by Linnæus, occurs in most of the Floras, but in recent years the authorities have agreed in resuscitating the name *Blackstonia* previously bestowed upon the plant by Hudson, the English botanist.

Small-flowered Winter-green (*Pyrola minor*).

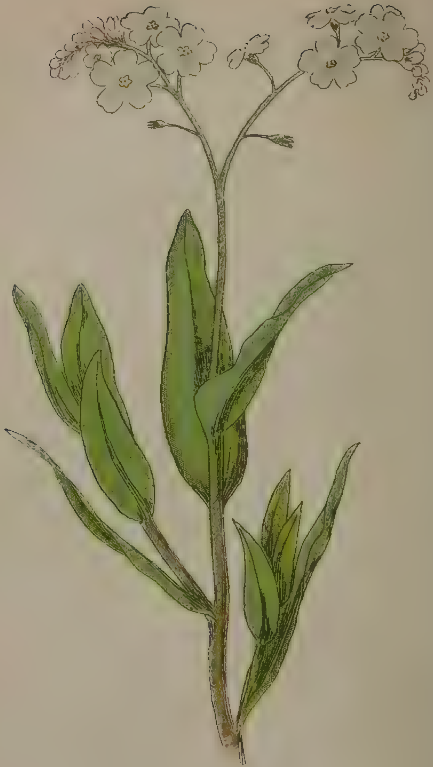
The Winter-greens—of which we have five species—are little known in the south of England, for they are mainly northern in their distribution. The species we have figured as a type of the genus, however, extends from the north of Scotland to the south of England, and is therefore most likely to be met with by our readers. They are perennial herbs, with a creeping rootstock and a short firm stem. Their leaves mostly spring from the rootstock, evergreen, and are mainly oval with a tendency to roundness, more or less toothed, and with long stalks. They are plants of the woodland, allied to the Heaths and Bilberry, and like them exhibiting some peculiarities in the way ot stamens. There are ten of these, in five pairs, springing from beneath the ovary, and each cell of the anther opens by a pore at the tip, through which the pollen is shaken out. The pollen grains are united in fours.

The Small-flowered Winter-green (*Pyrola minor*), has a stem only an inch or two in length, and roundish-oval leathery leaves, which are usually arranged in rosette fashion, from whose centre rises the flower-scape to a height of about a foot, bearing the raceme of small, drooping rose-tinged white flowers. These are globular in form, and consist of five sepals and five concave petals, with a globular five-celled ovary and a style ending in an expanded five rayed stigma. There is no real nectar, but the stigma-lobes are always moist, and visiting insects lick them. The stamens are of similar length to the style. The flowers are out in July and August, and are succeeded by rounded capsules, which discharge the minute seeds by five valves. The plant ranges from Kent and Devonshire in the south to Sutherlandshire in the north, growing in woods and on heaths ; it also occurs in Ireland, but is rare.

Other native species are :—



Small-flowered Winter-green.
Pyrola minor.
Ericaceæ.



Forget-me-not.
Myosotis palustris.
BORAGINACEÆ.

I. Intermediate Winter-green (*P. media*). Similar to *P. minor*, but larger. The leaves do not greatly exceed in this species, but the flowers are twice the size, measuring half an inch across; white. The stamens are shorter than the style, and the stigma divisions are minute lobes. It is more local, and occurs only from Warwickshire and Worcestershire to Shetland; also in north and west Ireland.

II. Round-leaved Winter-green (*P. rotundifolia*). Similar to *P. minor*, but with longer and finer leaf-stalks, the raceme longer and pure white flowers as large as those of *P. media*, but with the style longer than the stamens and curved downwards. The flowers, moreover, are fragrant: July to September. A rare plant found in woods of the damper sort, from Warwickshire and Worcestershire north to Shetland; it also occurs in East Kent; and in the north and west of Ireland.

The name of the genus is from the Latin, *pyrus*, a pear, from the foliage somewhat resembling pear-leaves.

Forget-me-not (*Myosotis palustris*).

As we have indicated in connection with the Germander Speedwell (page 7), our forefathers knew this plant as Water Mouse-ear Scorpion-Grass, and it was not until the last century that the name of Forget-me-not was transferred to it from the Speedwell. However, the present generation is not likely to tolerate any suggestion that *Myosotis palustris* is not the true Forget-me-not. It is the only one they have known, and it has been made too familiar pictorially under that name for any change to be possible now. So we declare that, in the present day, whenever Forget-me-not is named, it is the *Myosotis palustris* that is intended; or, as some know it, *M. scorpioides*.

The Forget-me-not is a perennial plant that grows beside or in streams and other wet places, often forming "beds." It has a creeping rootstock from which runners are given off, as well as the stout smooth stem. The leaves are slender, spoon-shaped, smooth, and light green; those from the root stalked, those on the stem stalkless. The flowers are grouped in cymes, which are at first very short, but as the buds open in succession the stalk lengthens and curves in a manner that has suggested the curl in a scorpion's tail. Hence the significance of the name Scorpion-grass which is applied to all the members of the genus.

In a similar way the upper half of the leaf has suggested the form of a mouse's ear, and this idea is expressed in *Myosotis.* The calyx is bell-shaped with five teeth, and the corolla salver-shaped, the limb divided into five lobes, and the mouth of the tube partly closed by five notched scales. The five stamens and the short style are hidden in the tube.

These particulars respecting the flowers are common to all the species. The Forget-me-not (*M. palustris*) has the corolla light blue, yellow round the mouth ; the lobes notched in the centre of the margin ; measuring from ⅓ to ½ inch across. Flowers from May to July. The stem is hairy, but in this and the next species the hairs are scanty and without hooks, and the leaves bright and shining.

The Tufted Forget-me-not (*M. cæspitosa*) is similar to the last, but the rootstock sends forth no runners, and the stems are branched from the base. The flowers are only ⅙ inch in diameter. It grows in similar situations, and flowers from May to August.

Other common species are :—

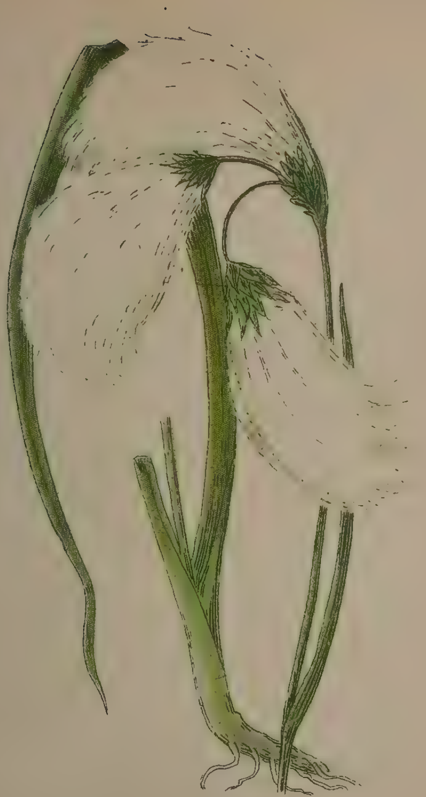
I. Field Mouse-ear Scorpion-grass (*M. arvensis*). Annual or biennial. In this and the following species the foliage is darker, and the calyx is covered with *hook-tipped* hairs. The stem is branched from the base, erect. The corolla, which is rather concave, is only ⅛ inch in diameter, rather pale blue, with yellow ridges round the mouth, which become white in older flowers. It is found in fields, woods, and wastes, flowering from May to August. The woodland form (var. *umbrosa*) is biennial, with larger and less concave corolla.

II. Early Field Scorpion-grass (*M. collina*). The little annual that one finds in spring on dry banks and old walls, with *bright* blue flowers ⅛ inch across ; April and May.

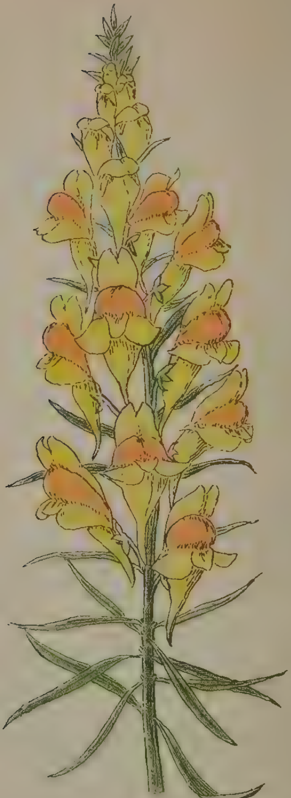
III. Yellow-and-Blue Scorpion-grass (*M. versicolor*). Similar to the last, but flowers at first pale *yellow* or white, then changing to *dull* blue. May and June.

Cotton-grass (*Eriophorum polystachion*).

Frequently in crossing moors we shall come across bogs where the Cotton-grass is the most conspicuous feature, its ragged white banners all fluttering in the breeze, and, should



Cotton Grass.
Eriophorum polystachion.
CYPERACEÆ.



Yellow Toadflax.
Linaria vulgaris.
SCROPHULARIACEÆ.

2 Pl. 57

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our visit be paid in the evening, gleaming out in strong contrast with the dark green vegetation around. It is well named Cotton-grass, for its seeds are furnished with long streaming silky hairs, which are analogous to those of the Cotton-plant (*Gossypium*).

Eriophorum is not strictly a grass, but a sedge, yet for a popular name grass is near enough. The plant is a rush-like perennial herb, with a short rootstock from which the bluntly triangular stems arise to a height of a foot or more, each smooth, flat leaf enfolding the stem and the next younger leaf by its lower portion. From the centre of this leafy tube the flowering stem emerges with several dull greyish, scaly bodies at the top. These are the flower-clusters, or spikelets, and their arrangement is somewhat similar to the flowers of grasses. The overlapping scales are *glumes*, and all except the lowest two or three contain a flower, the anthers and stigmas protruding. Calyx and corolla are represented in these flowers by a number of fine bristles, which lengthen as the flower matures and become the long silky streamers of the fruit. There are three stamens, a one-celled ovary surmounted by a long style that branches at the top into three feathery stigmas. As the solitary germ in the ovary develops into the mature nut, the spike becomes transformed into a tuft of silken filaments 1½ or 2 inches in length. Flowers May and June.

There were three other British species, but one has been lost through its native bog in Forfar being drained. The others are:—

I. Slender Cotton-grass (*E. gracile*), similar to the type, but the stems longer and more slender, the leaves short, very narrow, sharply triangular and channelled. The glumes broad, blunt, brown, and ribbed. This is a very rare species, and has been recorded only from the bogs of Surrey, Hants, and Yorks; flowering in June and July.

II. Hare's-tail Cotton-grass (*E. vaginatum*). Stems many, round below, but passing into triangular above, smooth, with several leafless sheaths. Leaves thread-like, triangular, very short. Glumes olive, nearly transparent. Bristles very numerous. Flowering April and May.

The name is from the Greek words *erion*, wool, and *phora*, bearing; suggested by the woolly heads.

Yellow Toadflax (*Linaria vulgaris*).

The Yellow Toadflax (*L. vulgaris*) immediately reminds one of the Snapdragon (*Antirrhinum*), to which its raceme of bright yellow flowers bears close resemblance; but the flowers themselves will be found to differ from those of Snapdragon in having a long tail or spur to the corolla. This spur is a hollow tube in which honey is secreted to attract long-tongued bees, in order that they may fertilize the ovules. Within the closed corolla there are four stamens, sometimes a fifth in a rudimentary condition, and the pistil ending in a notched stigma.

The plant has a slender rootstock, which creeps extensively underground, branching and sending up many stems. If these get into a garden the owner is at first delighted with the neat, bright appearance of the tufts of linear leaves; but by-and-by he finds its creeping rootstocks have taken entire possession of the bed, and become extremely difficult to extirpate. It is abundant in hedges and waste places, flowering from June till October. There is a variety with the flowers white, except the swollen "palate," which remains orange. Occasionally one meets with the form known as *Peloria*, in which the flowers are regular, with five lobes to the lip and five spurs. Other species are :—

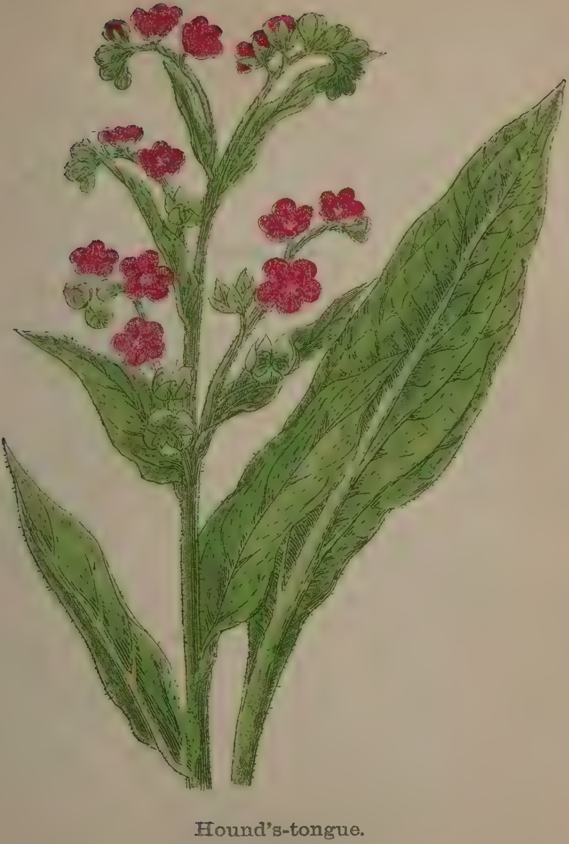
I. Round-leaved Toadflax, or Male Fluellin (*L. spuria*), with egg-shaped or round leaves and trailing branches; hairy. Corolla yellow, with purple throat and spur greatly curved. Annual. Sandy cornfields. July to October.

II. Sharp-pointed Toadflax, or Fluellin (*L. elatine*), with spear-shaped leaves and trailing hairy branches. Corolla yellow, upper lip purple beneath. Spur straight. Annual. Dry, chalky, and gravelly cornfields. July to October.

III. Pale-blue Toadflax (*L. repens*). Perennial. Smooth. Rootstock creeping. Leaves narrowly lance-shaped. Corolla violet, with darker lines and yellow palate; spur blunt. Waste places, rare. July to September.

IV. Small Toadflax (*L. minor*). Annual. Downy. Leaves narrowly oblong. Corolla but slightly larger than the calyx, purple, the lower lip white, and the palate yellow. Local, in sandy and chalky cornfields. From May to October.

V. Ivy-leaved Toadflax (*L. cymbalaria*) will be found described and figured on page 84, and plate 72.



Hound's-tongue.
Cynoglossum officinale.
BORAGINACEÆ.

2 *Pl.* 58

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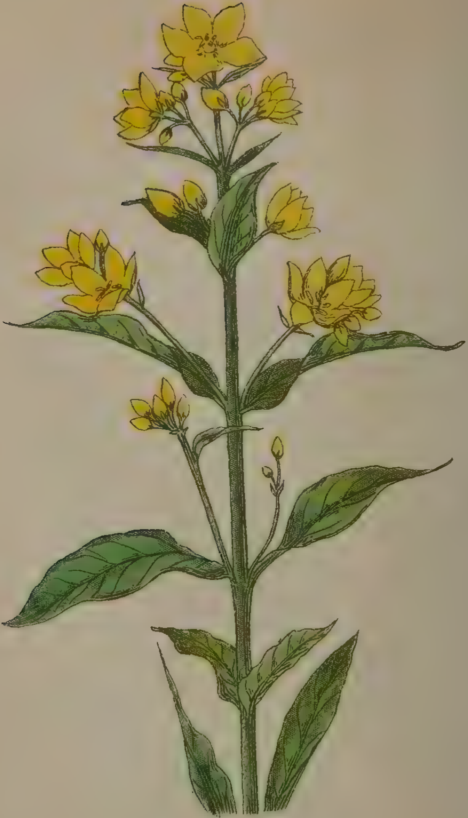


Yellow Loosestrife.
Lysimachia vulgaris.
PRIMULACEÆ.

VI. Purple Toadflax (*L. pelisseriana*), a small erect annual with slender leaves and a few small violet-purple flowers, is found in Jersey, flowering in June and July.

The name is from the Latin *linum*, flax, from the resemblance of the leaves in Yellow Toadflax and other species.

Hound's-tongue (*Cynoglossum officinale*).

The Common Hound's-tongue cannot fairly be described as a common plant, and yet in some localities it is plentiful enough. Where the Viper's Bugloss is plentiful, the Common Hound's-tongue may be looked for. It does not follow that it will be found, but the two plants grow in similar situations and sometimes in close proximity.

Like many other members of the Borage family, it is a hairy plant, though in this case the hairs are soft and downy, and give a grey effect to the whole plant. It is a biennial, and in its first year stores up material for its second year's flowering in a fleshy tapering root. Its root-leaves are nearly a foot long, stalked, and of an oblong or broad lance-shape. The flowering stem is 2 or 3 feet high, its leaves lance-shaped and stalkless. The flowers are funnel-shaped, ½ inch across, of a dull crimson colour, in forked, lengthening cymes. When the corolla has fallen, the gaping calyx discloses four flattened nutlets, with the margin raised and thickened, and covered with short, stout, hooked spines, that enable them to cling tenaciously to fur, feather, or textiles. The flowers appear in June and July, and the whole plant gives out a mousy odour. It has narcotic and astringent properties.

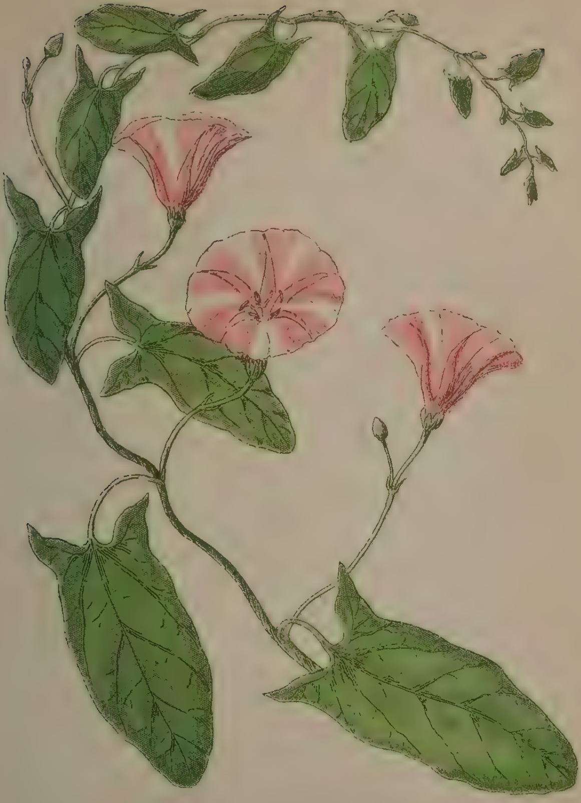
There is only one other native species, the Green-leaved Hound's-tongue (*C. montanum*), a rougher, but much rarer plant. The upper sides of the leaves are less thickly clothed with hairs, and have a smoother, greener appearance. Otherwise the plant, though less robust, is very similar in appearance to *C. officinale*. Its flowers, however, at first red, change to blue, and the nutlets are without the thickened margin. It flowers from May to July, but is much more restricted in its range than the common species. A line drawn from Shropshire to Norfolk would roughly mark its northern boundaries, and the same line continued from Salop to Surrey, and Surrey to Kent, would mark its western and southern limits.

The name is from the Greek *kuon*, a dog, and *glossa*, a tongue, from the stem-leaves being supposed to resemble the tongue of a dog.

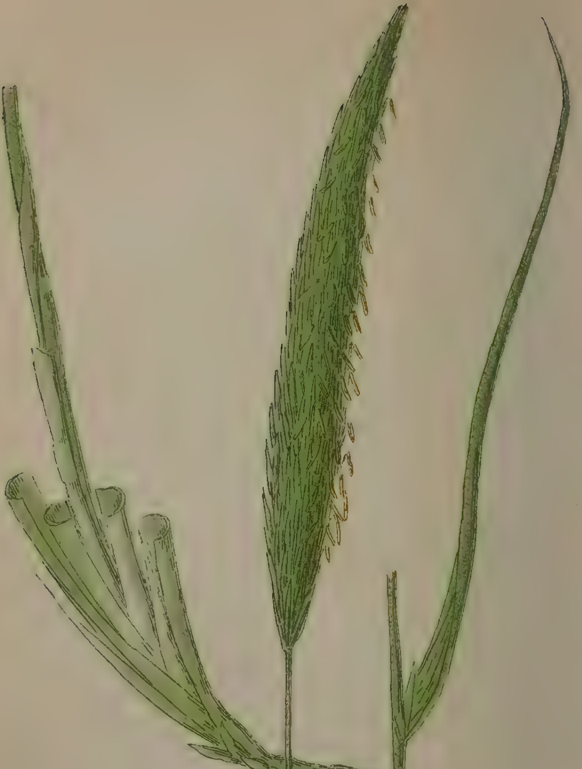
Yellow Loosestrife (*Lysimachia vulgaris*).

The genus to which this plant belongs is included in the Primrose order, and its best-known species is the Creeping Jenny (*L. nummularia*) of gardens and town window-sills. Another species is the Yellow Pimpernel (*L. nemorum*) of damp woods (*see* page 32). The Yellow Loosestrife (*L. vulgaris*) differs from these trailing plants in having an erect, downy stem, 3 or 4 feet high, arising from a creeping rootstock. The leaves are broad lance-shaped, with entire edges, stalkless, smooth or downy beneath, but with black glands on the upper surface. They are opposite on the stem, or in whorls of three or four. From the axils of the upper leaves grow the yellow flowers in cymes, with slender bracts. The flower parts are in fives or sixes. The calyx-lobes are margined with red and have hairy edges. The corolla is somewhat bell-shaped, deep yellow, dotted with orange inside, and ½ inch across. The stamens are united below to form a glandular tube, and the almost globose ovary, with its slender style, develops into a round capsule that splits open at the top with five teeth. The plant grows on river-banks and in wet, shady places, chiefly in England, and has dimorphic flowers, which appear from June to August.

There is another erect-growing species, the Tufted Loosestrife (*L. thyrsiflora*), not quite so tall-growing as *vulgaris*. The leaves are dotted with black, opposite, rarely whorled ; the lower ones small. The flowers are in dense, many-flowered



Field Bindweed.
Convolvulus arvensis.
CONVOLVULACEÆ.



Marram.
Ammophila arundinacea.
GRAMINEÆ.

racemes. The corolla is half the size of *vulgaris*, the lobes separated by a minute tooth. It occurs about marshy ground and on the banks of canals northward from Nottingham and Lancaster. Rare in England, more frequent in Scotland; flowering in June and July.

Field Bindweed (*Convolvulus arvensis*).

With the appearance of the delicately fragrant Bindweed in our fields the season for summer flowers may be said to have fairly set in. Its grace of form and colour makes it a general favourite, but it resents being plucked, and closes its pink cups almost immediately. It has a perennial rootstock, which creeps and branches for many feet underground, taking possession of much soil, and sending up numerous slender twining stems clothed with spear-shaped leaves. It is a pest in gardens, every little bit of underground stem broken off in digging taking root, and the aerial stems strangling tall herbaceous plants in their vicinity. The sepals are five in number, but the petals are entirely united to form a funnel-shaped corolla; though the five folds and lobes indicate the origin of the funnel. The flowers are honeyed and scented, and are much frequented by long-tongued insects, which have to push against the anthers in order to reach the honey, carrying away pollen with which to fertilize another flower. Like a careful, thrifty plant the Bindweed closes in wet weather, and at night, that its honey may not be reduced in quality. It flowers from June to September.

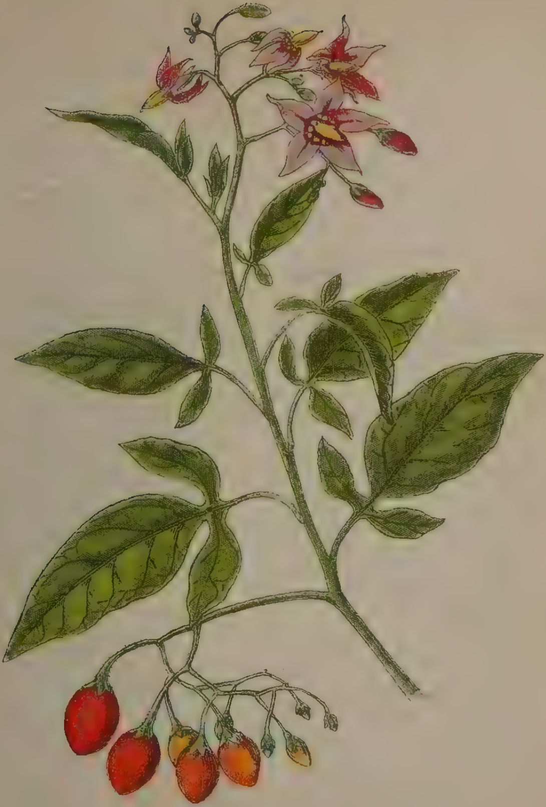
The Hooded Bindweed (*C. sepium*) is one of the most distinguished of our wild flowers, and it is almost impossible to see its large, pure white flowers ornamenting the hedge without desiring to acquire them. In general form it is like *C. arvensis*, but very much larger. Instead of being content to twine among low-growing herbs as that species, it climbs up the thickets to a height of 6 or 7 feet. In addition to the calyx this species has an enveloping pair of large inflated heart-shaped bracts —the "hood" of its popular name—which entirely conceal the calyx. The rootstock is thick and tuberous. Though it possesses honey it is not odorous, and appears to be, in consequence, but little visited by insects; it is, therefore, careless of the quality of its honey, and does not close its flowers in the rain, nor on moonlight nights, though it does so on dark nights. Sometimes the flowers are tinged or streaked with pink. Flowers June to August.

There is a third native species, the Seaside Convolvulus (*C. soldanella*), which does not twine, or but rarely. It has a long creeping rhizome, slender stems, and fleshy, kidney-shaped leaves. Its large rosy flowers are not numerous. There are two bracts, as in *C. sepium*, but they are smaller than the unequal sepals. It may frequently be found on sandy shores, and flowers from June to August.

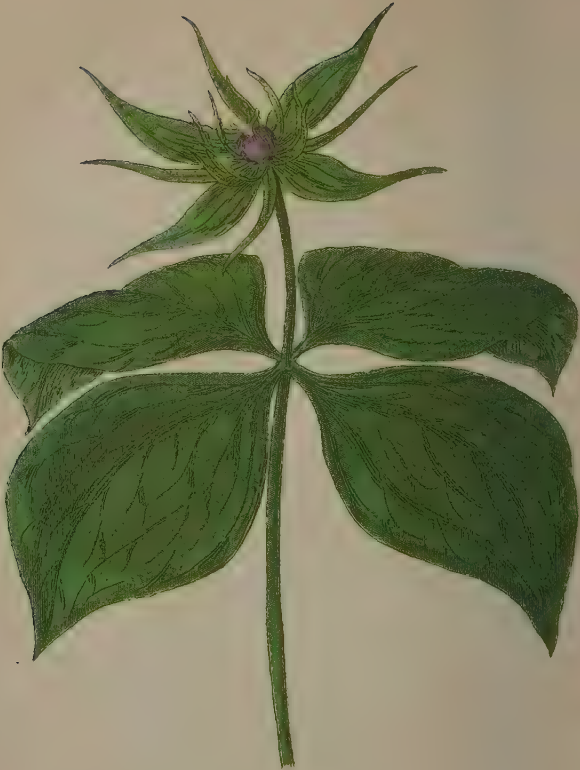
Marram (*Ammophila arundinacea*).

On many parts of the Cornish coast you are told of one Tregeagle who, having made a bargain with the devil and enjoyed the advantages accruing from it, has now to work out payment in the shape of service ; and among the hard tasks he is still toiling to perform is the weaving of the sea sands into ropes. The duty that Nature appears to have laid upon Marram grass is of a kindred character—to hold the loose, dry sands of the upper shore together and prevent them from rolling and blowing inland, to the ruin of agriculture and other industries. Marram sends its stout long rootstock underneath the surface, and spreads its fibrous roots down and around, enclosing the sands as in a mesh, and sending up rigid stems 3 or 4 feet high to act as a screen, preventing any quantity of the sand from blowing away. To inland dwellers who do not know Marram this may appear a small matter, but experience has proved this grass to be a valuable national asset. It is even believed to have an Act of Parliament all to itself, for it is stated that, owing to damage caused in various places by the pulling up of Marram for some other purpose, an Act was passed so long ago as the reign of Elizabeth, making it a punishable offence to remove or destroy this plant. Whether that Act still remains on the Statute Book we do not know, but it is interesting to find that in certain matters of this sort Parliaments of old were more practically patriotic in the true sense than their modern successors have been.

The leaves of Marram are long, stiff, and with one side rolled within the other. The flower-panicle is rounded, 4 or 5



Bittersweet.
Solanum dulcamara.
SOLANACEÆ.



Herb Paris.
Paris quadrifolia.
LILIACEÆ.

2 *Pl.* 63 *F* 71

inches long, of a whitish green, with yellow anthers hanging out. The spikelets comprised in it are erect on rough footstalks. The two empty glumes are stiff, sharp-pointed, and narrow, with a rough keel, and the flowering glumes are like them, but have a tuft of silky hairs at their base. The plant flowers in July, and may be found on almost any part of our coast where there are sand-hills. Also known as *A. arenaria.*

There is another native species:—

Baltic Sea-Reed (*A. baltica*), but it is restricted in range to the Norfolk coast, Ross Links in Northumberland, and Holy Isle. It is similar to the common species from which it is distinguished by its panicle being more lance-shaped than cylindrical, and the spikelets less compact. The glumes, too, are more acute, and the hairs shorter.

The name of the genus is from the Greek *ammos*, sand, and *philo*, lover.

Bittersweet (*Solanum dulcamara*).

One of the most familiar objects in the hedge is the trailing stem and variously shaped leaves of the Bittersweet or Woody Nightshade; the singular flowers or the red berries attract our attention at once. This and the Common or Black Nightshade are the sole British representatives of a genus that includes the Potato among other valuable exotic species.

Bittersweet is a perennial, with a creeping rootstock, from which arise the long trailing stems that have no means of climbing in the shape of tendrils, hooks, prickles, or the power of twining, but yet by leaning against the stouter hedge plants manage to attain a height of 4 or 5 feet. The leaves vary much, the lowest being heart-shaped, the upper more or less spear-shaped, with gradations between these forms. They are very dark green in colour, and all stalked. The calyx is five-parted; the purple corolla with five lobes, each having at its base two small green tubercles. The five yellow anthers have their edges united, so that they form a pyramidal tube, through which the style protrudes. The anthers discharge their pollen by terminal pores. The succeeding berries are egg-shaped, and go through a series of colour-changes from green through yellow and orange to a fine red. The popular name is founded upon a peculiarity which we have never tested: it is said the stems when tasted are first bitter, then the sensation changes to one of pleasant sweetness. Flowers June to September.

The Common or Black Nightshade (*S. nigrum*) is an annual with an erect stem, about 2 feet in height. Its leaves are egg-shaped, the blade gradually narrowing to the stalk, with a waved or toothed margin. The corolla is white, the berries rounder, usually black, but sometimes yellow or red. Fields and waste places, flowering from July to October.

Herb Paris (*Paris quadrifolia*).

This, the only British representative of the genus, presents the anomaly of a Liliaceous plant, with its parts usually in sets of four. There is a stout creeping rootstock, with a rounded stem about a foot in height, bearing a single whorl of leaves and a solitary flower. The general outline of the leaves is oval, but pointed at each end; these are almost always four in number, arranged in two opposite pairs (*decussate*) on the same level. Rarely, there are only three, or there may be as many as five or eight. From the centre of the leaves the flower-stalk rises, slightly curved. The evil-smelling flower is about 1½ inch across, consisting of four green lance-shaped sepals, and a like number of yellow petals, as long but only about one-fourth of the width. The eight (sometimes twelve) stamens are singular, in the fact that the tissue (*connective*) joining the two cells of each anther is extended beyond the anther to a considerable length. The four-celled purple ovary develops into a black-hued berry, which splits irregularly to discharge its black seeds. Concerning the ovary, it should be pointed out that it shines as though wet, and this effect plays a part in the cross-fertilization of the flower. The Dung-fly and other flies with low tastes are attracted by the odour, with the hope that they are coming to carrion, and when they alight on the styles and see the moist-looking ovary they think they have reached it. They begin licking it, but getting no satisfaction from the exercise, crawl up the stamens as the nearest way out, and dust their undersides with pollen, some of which doubtless gets left on the stigmas of another flower.

It is a local plant, but the flower-lover may hope to come across its striking form one day in May or June, when rambling through some moist, shady wood.

The name is said to be from the Latin, *par*, *paris*, equal, in allusion to the four-parted regularity of this species.

Purple Helleborine (*Epipactis latifolia*).

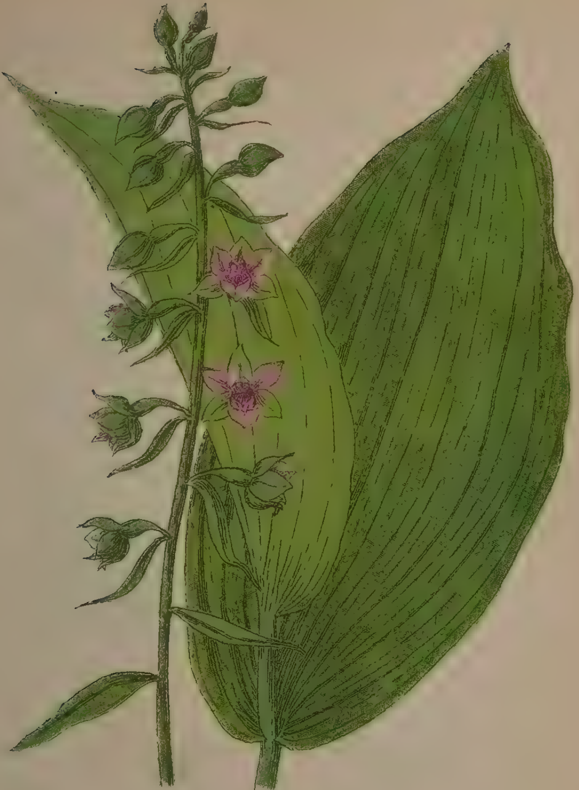
Though bearing a similar popular name to that of the White Helleborine (*Cephalanthera pallens*), described on page 126, this plant does not belong to the same genus, but they stand very close to each other. At one time the species of *Cephalanthera* were included in *Epipactis*, but have since been separated by Richard, the French botanist, on account of important differences in structure. *Epipactis* is much more plentiful and more widely distributed than *Cephalanthera*, occurring in woods and shady places throughout the kingdom, with the exception of the extreme north of Scotland. It has a creeping rootstock, and a solitary tall (3 feet) leafy stem ; the lower leaves egg-shaped, the upper ones narrower and smaller, all of them ribbed. The flowers form a one-sided raceme, with green bracts mostly larger than the flowers. They vary in colour from greenish with white, yellow, or purple markings, to a dull reddish-brown. In *Cephalanthera* and other genera of orchids, the ovary is twisted in order to bring the lip (which is properly the uppermost petal) to the lowest position on the flower. In *Epipactis* the ovary is quite straight, but the same result is attained by the twisting of the footstalk. Then it will be noted that there is no prolongation of the lip into a spurred nectary behind : the reason for this lies in the fact that the flower is not fertilized by bees or other long-tongued insects, but by wasps. To suit their particular shape of head and shortness of tongue, the lip is hollowed out behind to form a shallow bag, in which the nectar is secreted. The pollen-masses differ slightly from those of *Cephalanthera*, but are similarly placed to ensure their sticking to an insect that comes for honey. A wasp could enter this flower and take its fill of honey without disturbing the pollen-masses, but it cannot crawl out without striking against and detaching them, carrying them off to fertilize the next flower visited. So glutinous are the pollen grains that they cannot separate from one another and fall ; and even if they could they would not fall upon the stigma ; so that Darwin was justified in saying, " If wasps were to become extinct in any district, so probably would the *Epipactis latifolia*." The flowers are out in July and August. There are several recognized varieties or sub-species, ranked by some as distinct, but they do not appear to be very stable. There is one other distinct species :—

The Marsh Helleborine (*E. palustris*). A much smaller species, with stem not exceeding 1½ feet, lance-shaped leaves and short bracts ; fewer flowers, green striped with purple, the lip white streaked with red. Flowering in July, and found locally, in marshy places.

The name is the same as that used by the ancient Greeks for some species of Hellebore or Helleborine, and the genus is also called *Helleborine*.

Vervain (*Verbena officinalis*).

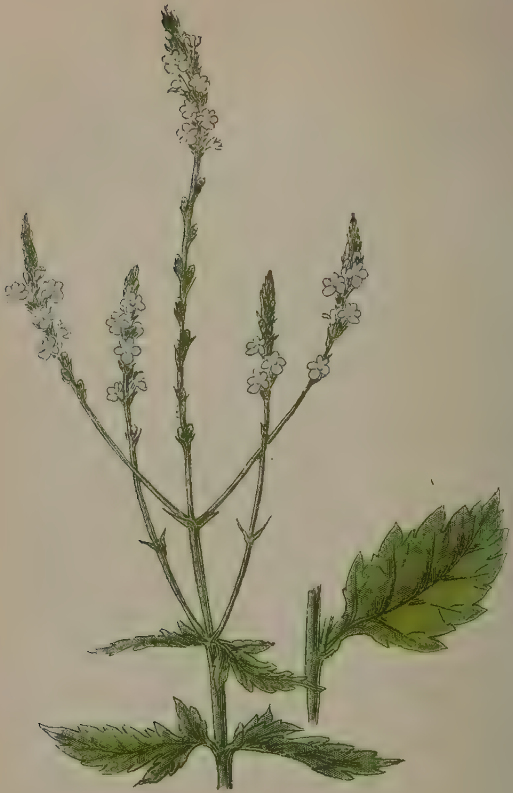
In certain localities the wayfarer comes upon a rather inconspicuous plant that may track his path for a mile or more, and then for a score of miles he may not see a solitary example. The species we refer to is the bright-eyed little Vervain, a plant that has enjoyed a magnificent reputation as a herb "chock full" of medicinal and magical properties ; but now apparently utterly neglected, save by the botanist, who is actuated by other



Purple Helleborine.
Epipactis latifolia.
ORCHIDACEÆ.

2 Pl. 64

F 74



Vervain.
Verbena officinalis.
VERBENACEÆ.

reasons than the desire to be rid of calculi, to improve his eyesight, ward off the pestilence, or to secure good luck. He may be desirous of these things, but he does not expect them to follow on the plucking of a plant of Vervain, even when gathered with the proper incantations.

Verbena officinalis is the solitary representative in our flora of the important genus, and the more important Natural Order Verbenaceæ, which includes some 700 species, chiefly tropical. It is a perennial, with a woody rootstock, and four-angled stems from 1 to 2 feet in height, the upper part branched. The oblong leaves are cut either into a number of lobes arranged pinnately or into three larger lobes. They occur on the stems in pairs (*opposite*), or in threes. The flowers are associated together in terminal spikes, with bracts. The calyx is tubular, with five teeth, one often shorter than the others ; the lilac corolla consists of a tubular portion and a spreading limb—what is known as salver-shaped. This spreading limb—the flat and most conspicuous portion of the corolla—is also five-cleft and unequally so to match the unequal calyx. Of the four stamens—mark how in all these matters the order resembles the Labiates—two are sometimes imperfect. The slender style ends in a couple of lobes, of which, however, only one is stigmatic. The flowers may be found on dry wasteland and by roadsides from July to September.

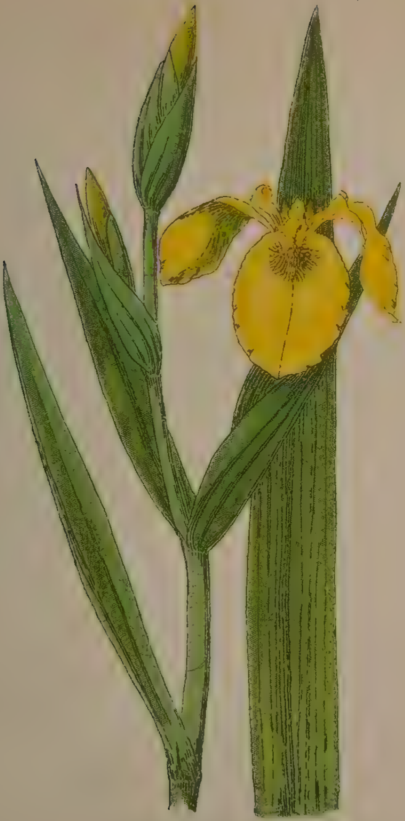
The name Verbena was the classical Roman name for this plant especially, and also signified "altar-plants" in general.

Yellow Flag (*Iris pseudacorus*).

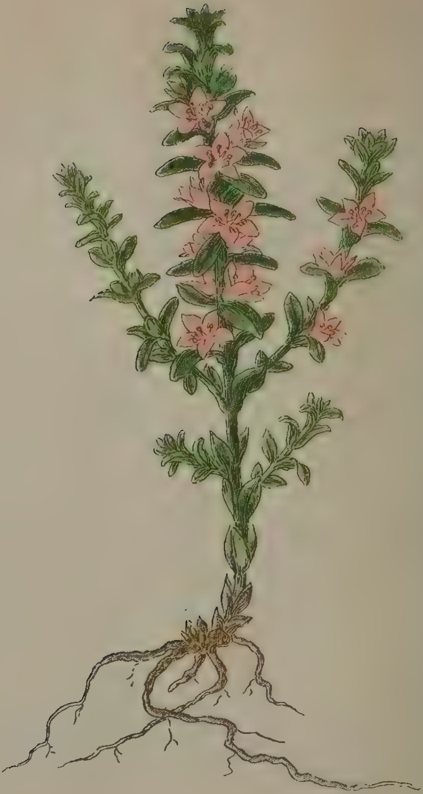
Fringing our rivers, ditches, and lakes, the Yellow Iris appears to be defending them with drawn sword. Everybody knows the sharp-edged leaves of these species, that may cut the hands of the gatherer if he be not careful. Equally well known are the bright blossoms that begin to appear in May and keep up a succession until late in July ; but probably most of the unscientific readers who have honoured me with their company thus far—and who have learned, I trust, to know the parts of a flower at sight—would be incorrect in their description of this common flower. Anyway, it will be worth their while dissecting one. The parts of the flower are in threes, but the sepals are more petal-like than the petals, and so are the styles. The sepals are in fact the most striking organs ; they are broad, and reflexed to form convenient alighting platforms for a heavy humble-bee. The petals are narrow, erect, or curved towards the centre of the flower, to be out of the way of the broader, arching style, which is spread out and coloured like a petal, with the stigmatic surface near the upturned tips. Beneath this arching style lies the anther, similarly curved, and opening away from the stigma.

Note the why and wherefore of this departure from ordinary arrangements of floral organs. At the bottom of the flower-tube honey is secreted, and to obtain this the flower is visited by humble-bees. In order that his long tongue may reach the honey, the bee has to push his head and back against the stigma and the anther. If he has previously visited a flag-flower his back will be covered with pollen, some of which will adhere to the stigma. He will also take away on his head and back some of the pollen from the flower he is now visiting, and will fertilize other flags with it. In another form of the flower the style lies so close upon the sepal that bees cannot get in ; but the long-tongued Honey-fly (*Rhingia rostrata*) can, and does ; and there appears to be a distinct connection between this fly and the variation in the floral arrangements.

There is another British species—Stinking Iris, Gladdon, or Roast-beef plant (*Iris fœtidissima*), with purple sepals, yellow petals and stigmas. Flowers not quite so large as the last. Woods and copses. May to July.



Yellow Flag.
Iris pseudacorus.
IRIDACEÆ.
(Reduced one-third.)



Sea Milkwort.
Glaux maritima.
PRIMULACEÆ.

Sea Milkwort (*Glaux maritima*).

On the low rocks that are splashed with spray at high water, we shall in all probability find considerable quantities of Sea Milkwort, or Black Saltwort, as it is alternatively named. It does not appear to be a very well-known plant, but there is no reason why it should not be, for it occurs abundantly not only on the seashore, but also in estuaries, and even in the inland salt-districts. On the Cornish coast it grows with its tough rootstock wedged between the layers of the slaty killas-rock; whilst it is equally at home in the salt-marshes. It is not a tall growing plant, its stem being only a few inches in height, and its leaves small, smooth, stalkless, and, like so many other shore-plants, thick and fleshy. Their margins are quite even, without teeth or lobes of any sort, and they are minutely pitted all over; the upper surface much darker than the underside, but of the blue-green hue that has given its Greek name to it, derived from *glaukos*, blue-green.

Examined closely the flowers will be seen to have no petals, but the calyx, which is bell-shaped, with five lobes, is coloured with a flesh tint, finely sprinkled with minute crimson dots. It blossoms from May to August, and its flowers are succeeded by globose fruits, similar to those of the Primrose and Pimpernel; it is, in fact, one of the Primrose family. There are no other British representatives of the genus.

Spurge Laurel (*Daphne laureola*).

The Spurge Laurel must be looked for in the copse and wooded hedge, where it flowers from January to April. It is fond of stiff soils, and is especially abundant on the chalk-hills. Its bright evergreen leaves make it conspicuous at a period when there is little fresh-looking vegetation, but it is often passed by in the belief that it is a young Rhododendron. It seldom exceeds 4 feet in stature, and is but slightly branched. The leaves are tough, leathery, oblong, sharp-pointed, almost stalkless, and they are chiefly clustered at the upper end of the stems. The flowers are yellow-green and smooth, produced in small clusters (*cymes*) from the axils of the upper leaves. The flower has a tubular perianth, with four spreading lobes, there being no distinction between sepals and petals. There are eight short stamens with yellow anthers attached to the tube in two series. In some of the flowers there is no style; in others of the same cluster it is present, but very short. The perfect flowers are succeeded by bluish-black berries.

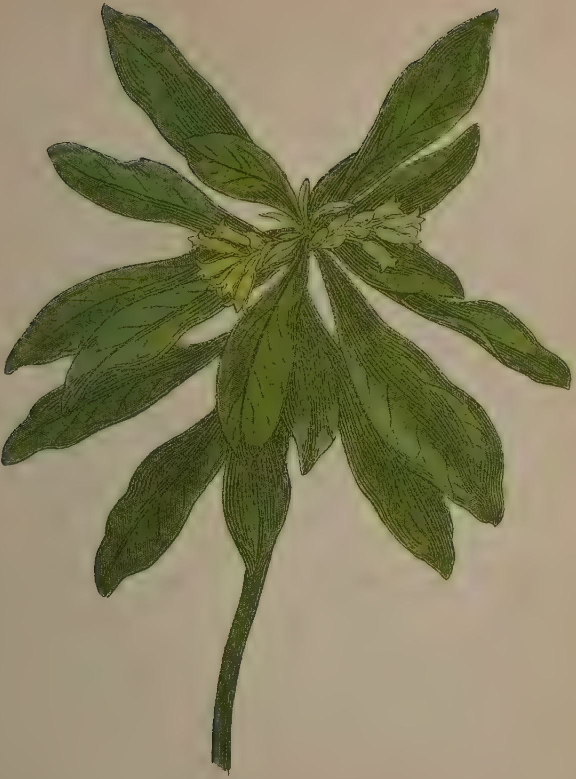
There is a second, but rare, species, the Mezereon (*D. mezereum*), growing somewhat taller, but the lance-shaped leaves are not evergreen. Early in the year, about February or March, it puts forth its fragrant pink flowers before a leaf has appeared. The leaves are produced in tufts at the end of the erect branches, and the flowers originate just above the scars of last year's leaves. The berries of this species are bright red. Both plants are very poisonous.

The name *Daphne* is from the classical myth of the daughter of Terra and Peneus, who was changed into a laurel to escape the importunities of Apollo.

Early Purple Orchis (*Orchis mascula*).

This is the Orchis that everybody knows—the "Cuckoo" of some districts—that rears up its stiff spike of purple flowers in field and wood in spring. Few of those flowers can ever succeed in ripening their seeds, for the greater number of spikes are gathered by country children who range the meadows in April searching for "Cuckoos" and cowslips.

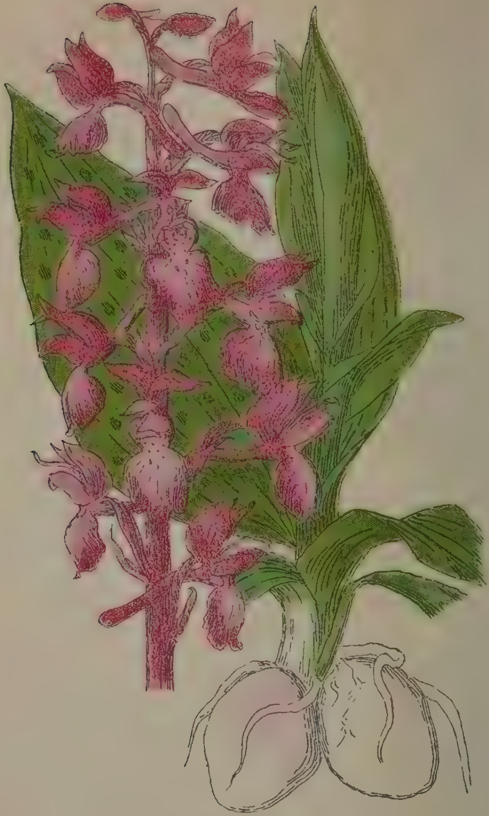
We have already given a brief general description of the flower-structure in Orchids (*see* page 24), and this will apply to the whole family, with slight modifications which will be pointed



Spurge Laurel.
Daphne laureola.
THYMELÆACEÆ.

2 *Pl.* 68

F 78



Purple Orchis.
Orchis mascula.
ORCHIDACEÆ.

out as we proceed. Purple Orchis springs from a couple of egg-shaped tubers, into which the plant withdraws after seeding, and from which arises in early spring a single stout stem wrapped round by the lower portions of the oblong, purple-spotted leaves. This stem is about 1 foot in length, the upper portion bearing a dozen or more flowers of reddish-purple tint—occasionally white—which appear in April and May. The lip is as broad as long, divided into three lobes, of which the middle lobe is the largest, and its margins are curved back. The lip is continued behind as a long, stout, hollow spur, obviously intended for honey, but none is secreted. The bracts below the flowers are coloured purple, and have a single nerve. The flowers have often a very objectionable "catty" odour, which may not be noticeable in the field, but becomes intolerable when such specimens are brought indoors. The tubers contain a quantity of starchy matter, which was formerly made into a drink called salep.

There are nine other native species in the genus *Orchis*, whose name is the old Greek appellation for plants with a pair of tuberous roots. The more generally distributed are :—

I. Green-winged Orchis (*O. morio*). In general appearance much like Purple Orchis, but leaves narrower and unspotted, upper ones wrapped round stem ; flowers of a darker duller purple, the sepals distinctly marked with parallel green lines ; sepals and petals (except lip) converging to form a hood ; spur stout, nearly straight. Tubers round. April to June in meadows as far north as Northumberland.

II. Marsh Orchis (*O. latifolia*). Tubers flattened and lobed (*palmate*). Stems tubular, 2 or 3 feet high. Leaves oblong or lance-shaped, usually ring-spotted ; bracts green, three-nerved. Flowers dull purple, lip scarcely lobed, spotted, side margins turned down ; spur short. Wet meadows and marshes, May to July.

III. Spotted Orchis (*O. maculata*). Tubers palmate. Stem 12 to 18 inches, solid. Leaves oblong lance-shaped, spotted or marbled with dark purple. Bracts green, three-nerved. Flowers lilac, streaked with purple, in a dense spike, at first pyramidal, then lengthening ; lip strongly three-lobed, as broad as long ; spur straight, not longer than ovary. Moist meadows and woods, May to July.

IV. Dark-winged Orchis (*O. ustulata*). Tubers egg-shaped. Stem 4 to 6 inches high. Leaves lance-shaped. Bracts green, one-nerved. Flowers small, in a dense oblong spike ; sepals and petals purple and green, forming a hood, lip four-lobed, white, with raised purple spots ; May and June, on chalk-hills and dry pastures, from Northumberland to Devon and Kent. Local.

V. Great Brown-winged Orchis (*O. purpurea*). Tubers egg-shaped; stem stout, 2 or 3 feet. Leaves oblong, unspotted, glossy. Bracts one-nerved, green. Flowers in a rather dense large spike. Sepals and petals variegated green and purple on the exterior, paler within; converging to form a hood. Lip four-lobed, side lobes long and slender; rosy, spotted with raised red points. Spur half the length of ovary. Chalk-hills and downs, Kent and Sussex only; May.

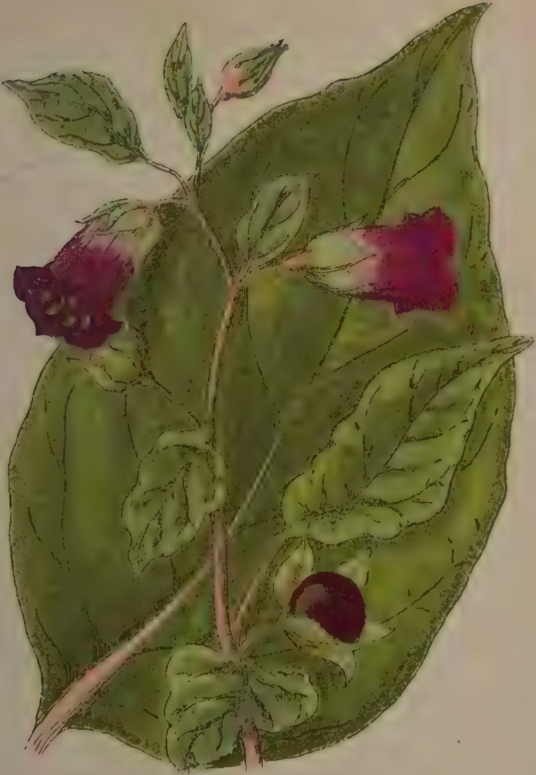
VI. Military Orchis (*O. militaris*). Tubers egg-shaped. Stem 1½ feet. Leaves large, oblong, unspotted. Flowers in dense oblong spike, pale purple, lip paler in middle, dotted with raised points, and divided into four slender lobes with a tooth between the middle pair. Chalk-hills of Berks, Bucks, Oxford, and Herts; May. A sub-species of this is known as the Monkey Orchis (*O. simia*). It has more slender flowers with narrower divisions of the *crimson* lip. It occurs in the same counties as the type, with the addition of Kent.

VII. Pyramidal Orchis (*O. pyramidalis*). Tubers round. Stem 2 feet high. Leaves lance-shaped. Bracts coloured, one to three-nerved. Spike pyramidal. becoming oblong as the upper buds open. Flowers rosy, lip broader than long, three-lobed, with two tubercles at its base. Spur slender, larger than ovary. Chalky pastures from Wigtownshire and Berwick southward; June to August.

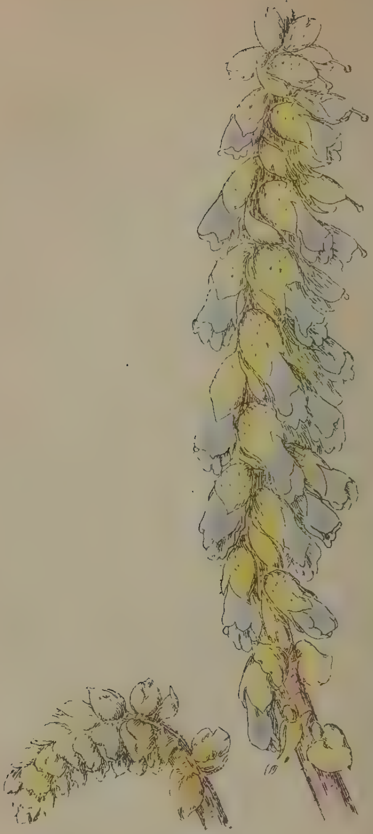
Deadly Nightshade (*Atropa belladonna*).

Deadly Nightshade, or Dwale, is often found in the neighbourhood of ruins and on the sites of former gardens. In such places it is probably the descendant of plants that were grown there long ago for use in that branch of "domestic medicine" which concerned itself with the mixing of potions to quiet troublesome or superfluous friends. When it occurs on open wastes above chalk or limestone, it may be considered indigenous.

It is a perennial plant, and forms a thick fleshy rootstock, from which come a number of stout annual stems, 3 or 4 feet in height, forming a bush. The leaves are stalked, egg-shaped, with entire edges, and dark green. The flowers droop on curved stalks that spring from the axils of leaves or shoots. They have a five-parted calyx, and a five-lobed, bell-shaped, dull purple corolla, about an inch across. The five stamens are inserted at the base of the bell, but the anthers come up to the mouth. The ovary is two-celled, and develops into a globular, black, shining berry as big as a cherry. It flowers from June to August.



Deadly Nightshade.
Atropa belladonna.
SOLANACEÆ.



Toothwort.
Lathræa squamaria.
OROBANCHACEÆ.

The form and size of the flower adapt it to the visits of humble-bees of medium size, for whom nectar is secreted at the base of the ovary. The stigma is mature at the opening of the flower, but the anthers are not. A bee that has been in an earlier flower and got her back dusted with pollen is sure to leave some of this on the stigma as she brushes under it to reach the nectar. When in an older flower, whose stigma has passed the receptive stage, she is as certain to shake down pollen from the now opened anthers upon herself.

The whole plant has an unpleasant smell, and is generally poisonous; but the juice of the berries is specially so. These have often proved too attractive to children, who have eaten them and died. Under the names of atropine and belladonna the juice is prescribed in modern medicine, chiefly for external use, and oculists find it valuable for its effects when dropped into the eye—the pupil dilating considerably and so facilitating examination. This trick was probably learned from the Italian ladies who have long used it to increase the apparent blackness of their eyes by enlarging the pupil, and from this practice comes the name *belladonna*. The mere handling of the plant may be attended with inconvenience through this property. Our artist, in making her drawing of the accompanying plate, found her sight undergo such a change that her work had to be abandoned that day, owing to great dilatation of her pupils. She had inadvertently touched her eyes, it is presumed, with the fingers that had been manipulating the leaves and flowers of this plant.

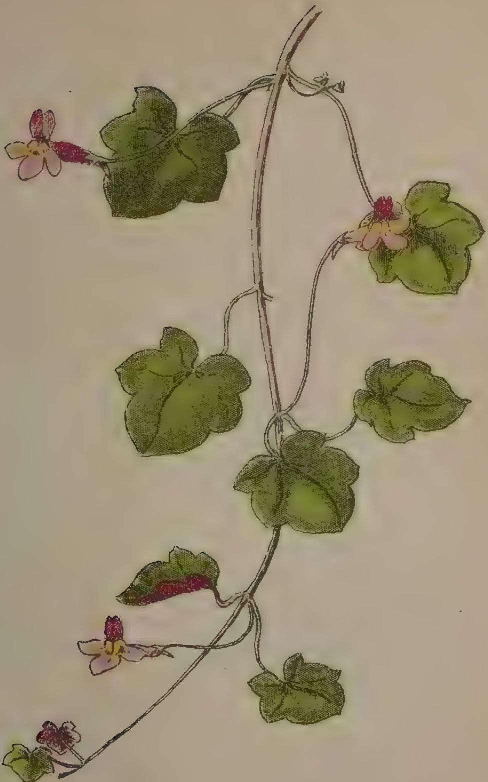
Dwale is an old English adjective, signifying delirious. The name *Atropa* is obviously derived from Atropos, whom the ancients represented standing with ready scissors to cut short the destinies of all, as her sister Fates spun them out. This is the only species.

Toothwort (*Lathræa squamaria*).

The Toothwort is one of those strange plants, like the Broom-rapes (p. 140), that have learned to exist mainly at the expense of others. It is a leafless parasite, that consists solely of a fleshy underground rootstock, and a flower-stem which bears, besides the flowers, a few scales and bracts. It is quite innocent of any of the green colouring matter (chlorophyll), by whose aid ordinary plants are able to manufacture their body material out of the elements, and it might therefore be presumed, on the strength of analogous cases, that it is a pure parasite. In recent years, however, it has been believed that some portion of its nutriment is obtained by pursuing the vocation of a trapper of innocent animalcules, which are done to death and digested by it.

The rootstock is branched and the branches are covered with thick scales; it also has rootlets which attach themselves by suckers to the rootlets of hazel, elm, etc. The thick fleshy stems are from eight to sixteen inches in length, the upper half being covered with the solid-looking flowers and their bract-scales. The flowers are all on one side of the stem, and arranged in from two to four rows. The stems appear in April, and at first are much bent, but later become quite erect. The whole plant is whitish, or flesh-coloured, with a tinge of purple. Each flower is about half an inch long, and consists of a pale two-lipped calyx, and a longer purplish two-lipped corolla, with four stamens, and a protruded style. The upper lip of the corolla is arched, and the smaller lower lip is notched into three teeth. The flowers continue into May, and are succeeded by egg-shaped capsules, which open by two valves to distribute the minute seeds.

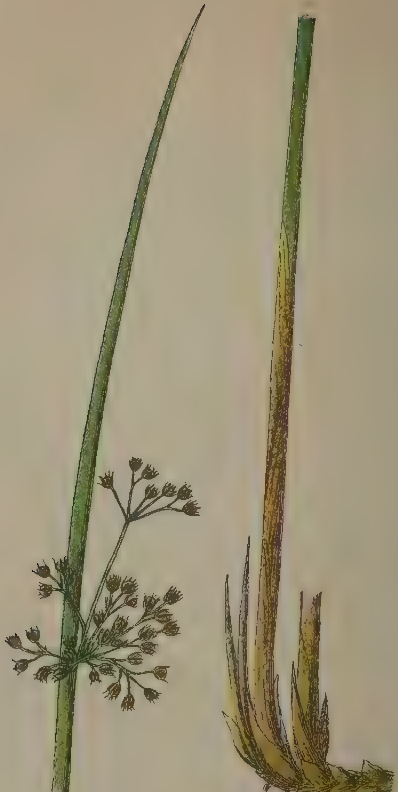
The flowers are fertilized by humble-bees, for whose recompense nectar is provided by a gland on the lower surface of the ovary. To avail itself fully of these visits, before the flower



Ivy-leaved Toadflax.
Linaria cymbalaria.
SCROPHULARIACEÆ.

2 *Pl.* 72

G 82



Common Rush.
Juncus effusus.
JUNCACEÆ.

2 Pl. 73

G 83

opens fully the pistil with its ripe purple stigma protrudes, and receives pollen from any bee that has already visited an older spike. The anthers mature later and shed their dry pollen, but owing to the anthers being covered with hairs the pollen does not fall until a nectar-seeking bee touches the stamens and shakes it down upon her. If the bee does not come to effect cross-pollination, the Toothwort seeks the aid of the wind in fertilizing the younger flowers of the colony. First the corolla lengthens so that the style no longer protrudes. Then the stamens lengthen so that the anthers hang beyond the mouth of the flower, and the wind is able to carry the dry pollen to the stigmas of newer flowers.

To return to the Toothwort's trapping proclivities: the apparently innocent and useless-looking underground scales are hollowed out into a series of chambers, whose entrance is hidden under the curved end next the stem. The walls of these chambers are studded with stalked glands, from whose heads delicate filaments of protoplasm stretch out. Minute creatures in the soil enter these chambers, for no particular reason that is known, but probably impelled by curiosity, much as tiny water-creatures enter the traps of the Bladderwort (page 129). Whatever the impulse, they do enter, for they have been found there; and a few years ago it was stated that they were digested and their material used by the Toothwort for its own nourishment. Later research, however, has shown that this is not the case, and that the glands serve the purpose of efferent ducts through which the plant, being leafless, disposes of the excess of water derived from the roots of its host.

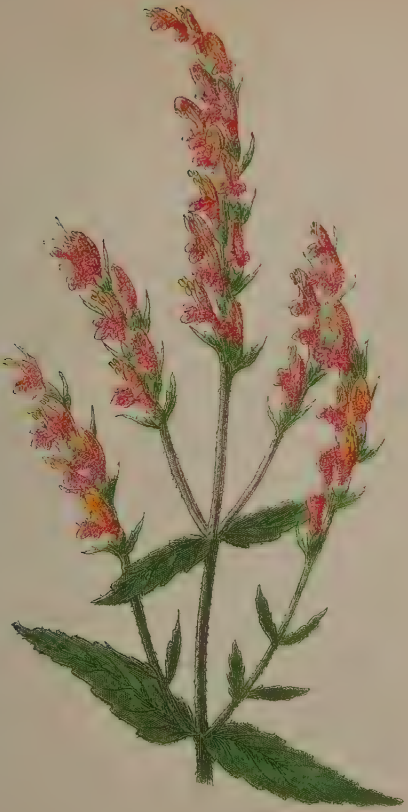
So far as we can judge from the appearance of certain elms that we have known for many years as supporting this plant, no damage is done to the tree by its humble guest. It would be no surprise if some future investigator should prove that the Toothwort in turn conferred some benefit upon its host.

Though not a common plant, the Toothwort is generally distributed as far north as Perthshire and Inverness ; and in Ireland. A shady bank that supports a hazel spinny or hedgerow is a suitable situation in which to look for it. It is the only British species.

The name of the genus is derived from the Greek word, *lathraios*, hidden, in allusion to its obscure habitat. "Toothwort" may have had reference to either the unopened flowers or the shape of the scales, which resemble teeth. Having such a name and such "signatures" it was—of course—formerly considered as a remedy for toothache. Modern medical practice, however, appears to have failed to find any preventive or curative virtues in it. *Squamaria* is from the Latin, *squama*, a scale, in allusion to the outgrowths from the lower part of its stems.

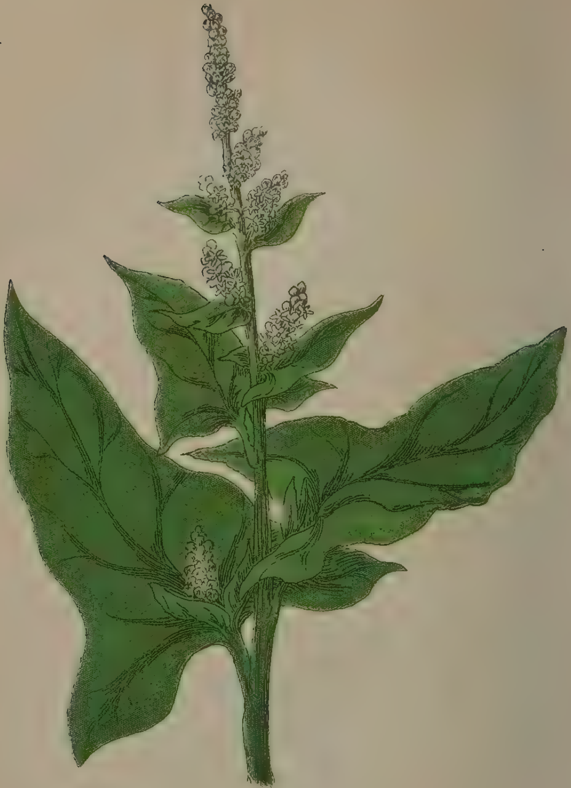
Ivy-leaved Toadflax (*Linaria cymbalaria*).

The Ivy-leaved Toadflax (*Linaria cymbalaria*) will be found forming a beautiful tapestry on ruins and old walls. It is a Continental species, and those specimens found naturalized here are believed to be the descendants of greenhouse escapes. The stems are very long and slender ; the leaves lobed in a manner that suggests certain forms of Ivy, often purple beneath, dark green above. The calyx is five-parted, and the blue-purple corolla is fashioned like that of the Yellow Toadflax described on page 66. The two lips are so formed that they close the mouth of the corolla, but the so-called *palate* is coloured yellow to show an insect where to seek admittance to the honey. When the seed-capsule is nearly ripe, it turns about on its stalk and seeks a cranny in the wall, where it can disperse its seeds. In this way old walls in some places have become beautifully and completely draped by it. Flowers July to October. Other species of Toadflax have the trailing habit, but *L. cymbalaria* is the only one we have with a preference for a mural habitat.



Red Bartsia.
Bartsia odontites.
SCROPHULARIACEÆ.

2 Pl. 74 *G 84*



Good King Henry.
Chenopodium bonus-henricus.
CHENOPODIACEÆ.

Common Rush (*Juncus effusus*).

We have already described and figured (*see* page 9) the Wood-rush (*Luzula*), which is own cousin to *Juncus*, the two genera forming the Natural Order Juncaceæ. The two groups differ most conspicuously in their leaves; those of *Luzula* being flattened, grass-like, and hairy, whilst those of *Juncus* are round, stem-like, smooth. In the common species (*J. effusus*) these leaves are all reduced to sheaths round the lower portion of the stems, as appears in the illustration. The stems are densely matted in a circular tuft; they are cylindrical, but stuffed with a continuous pure white pith, which of old served for the wicks of rushlights. Externally they are smooth, but very finely grooved lengthwise; and grow to a height of 3 feet. The flowers are clustered in cymes, which are, in this species and several others, never produced at the end of the stem (*terminal*), but at the side (*lateral*) about halfway up. They are of the same lily-like type as *Luzula*—a perianth of six segments, the three outer green with a thickened midrib, the inner brown and semi-transparent. There are in this species but three stamens, but in most others there are six, attached to the perianth segments. It flowers in July and August, and occurs in moist places on heaths, in fields and wastes everywhere. There are no fewer than eighteen British species, and several sub-species.

The name is the Latin for Bulrush, derived from *jungo*, to join, in allusion to its use for tying bunches of herbs and flowers.

Red Bartsia (*Bartsia odontites*).

There are several genera of the order Scrophulariaceæ, whose species are parasitic upon the roots of other plants. These are Eyebright, Yellow Rattle, Lousewort, Cow-wheat, and Bartsia

All agree in their form of parasitism, and also in the fact that, despite their diversity of colour when fresh, they all turn black when the collector carefully dries and presses them for his herbarium. In general appearance Bartsia does not greatly differ from the Yellow Rattle, though it lacks the prominent bladders. Other points in which it differs are: this flower is not compressed like that, and the upper lip of Bartsia is arched over. The corolla is pink, or dull purple, and downy. The whole plant, in fact, is tinged with purple, and downy. Honey is secreted at the base of the corolla-tube. The anthers are hairy, and hang close together above the mouth of the tube; the filaments being so bent as to allow room for the passage of a bee's proboscis in its search for honey. The anthers ripen before the stigma, which afterwards comes into as prominent a position, and gets fertilized with pollen brought on the bee's back from an older flower. It flowers from June to August, in fields and wastes. The other British species are :—

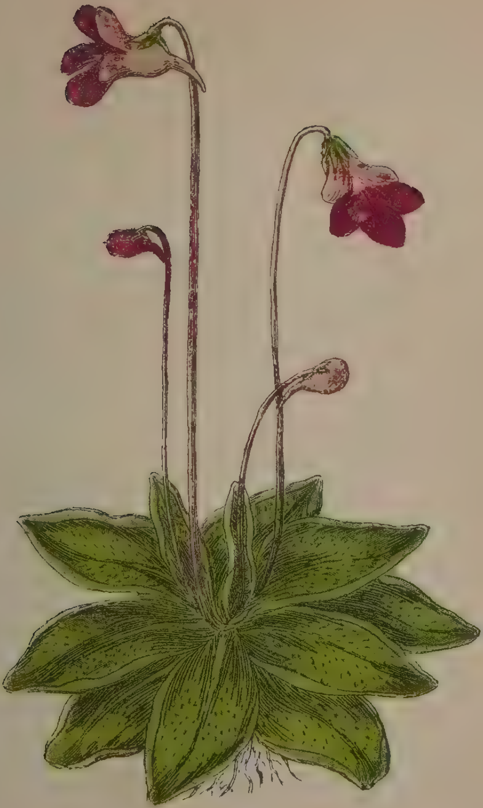
I. Yellow Bartsia (*B. viscosa*). Annual. Whole plant downy with viscid hairs, including yellow corolla. Lower lip of corolla large. Flowers June to October; meadows and pastures chiefly in extreme South of England and West of Ireland.

II. Alpine Bartsia (*B. alpina*). A rare perennial, found only in rocky alpine pastures in the north. Rootstock woody. Leaves somewhat leathery. Bracts purplish. Corolla dull purple. Flowers June to August.

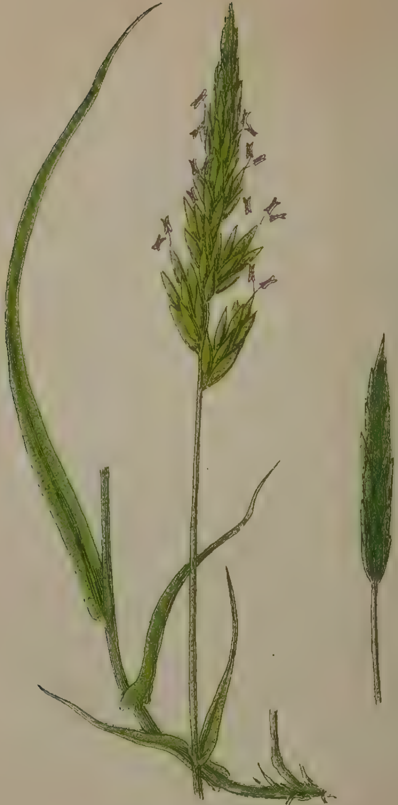
The genus was named by Linnæus after his friend, John Bartsch, a Prussian botanist.

Good King Henry (*Chenopodium bonus-henricus*).

The genus to which this plant belongs consists of thorough weeds. Their habitat is waste places, usually where the soil is made up of man's refuse. The plants are fairly uniform in colour, from stem to leaf and flower. They are fertilized by the wind, so they have no need to put on showy colours to attract insects. The flowers are small, and the petals are entirely wanting; they consist of from three to five sepals, from two to five stamens ranged around the ovary, which is surmounted



Butterwort.
Pinguicula vulgaris.
LENTIBULARIACEÆ.



Vernal Grass.
Anthoxanthum odoratum.
GRAMINEÆ.

by the two or three spreading stigmas. Some are distinguished by unpleasant odours, and they have little to attract popular attention, although some have been used as potherbs—notably the species figured, which rejoices in the alternative titles of "Mercury Goosefoot" and "All-Good."

Good King Henry (*C. bonus-henricus*) is a perennial with a thick fleshy rootstock, and erect channelled stems from 1 to 3 feet in height. The leaves are large, dark green, and of the shape that botanists describe as "hastate," that is, like the head of an ancient halberd. These leaves are somewhat succulent, and in some places are used as a substitute for spinach. The ovary when ripe becomes what is technically known as an *utricle*, a thin loose case containing a single seed. In this species the seed is black, marked with small punctures. Flowers May to August.

All the other British species are annuals, and among them may be noted:

I. Stinking Goosefoot (*C. vulvaria*), with spreading stems, small, greasy, mealy, untoothed leaves, grey-green, with an odour like rotten fish.

II. Many-seeded Goosefoot (*C. polyspermum*), with several spreading branches, ovate leaves, and many minute, rough, dark brown seeds.

III. White Goosefoot (*C. album*). Leaves ovate, covered with a white mealy substance, upper portions *toothed*, sepals keeled, seeds dark, shining, very minutely dotted.

IV. Red Goosefoot (*C. rubrum*), with erect, frequently red, stems, smooth and shining, leaves variable in form, and in the character of the margin, which is sometimes toothed, sometimes entire; sepals not keeled.

The name is from two Greek words, *chen* and *pous*, signifying Goosefoot, in reference to the shape of the leaves in some species.

Butterwort (*Pinguicula vulgaris*).

This is another of our beautiful bog-plants; and, like the Sundew, not interesting on account of its beauty only, but for its carnivorous propensities also. *Pinguicula* is among our insectivorous plants, a fact that was not suspected till about forty years ago. It is a perennial herb that has no stem, but consists of a rosette of thick greasy leaves with incurved edges.

From the centre of this cluster there are sent up several leafless, purplish stalks, from 4 to 6 inches in height, each bearing a solitary violet flower on the recurved tip. The calyx is five-lobed, the lobes unequal. The corolla is two-lipped, unequal, the upper lip having two lobes, the lower three ; there is also a slender spur. It flowers from May to July, in boggy ground, chiefly in the north, but found sparingly as far south as Hants and Devon. There is a sub-species, *P. grandiflora*, with larger, broader leaves, larger flowers (1 inch), the corolla lobes overlapping. Found only in the bogs of Kerry and Cork. The other British species are :—

I. Pale Butterwort (*P. lusitanica*), found only in the bogs of South-west England, from Cornwall to Hants ; West Scotland, and Ireland. A much smaller plant, with inconspicuous lilac corolla, the lips nearly equal, the spur short, broad, blunt. Leaves thin and small. Flowers June to October.

II. Alpine Butterwort (*P. alpina*). Intermediate in size between the foregoing, but scapes shorter. Leaves thick. Corolla white with yellow throat, and very short, conical, broader spur, curved upwards. Bogs of Skye, and Black Isle, Ross-shire. May and June.

In these plants the upper surface of the leaves is covered with glandular hairs, which secrete a very sticky fluid, giving rise to its popular and scientific names : *pinguis*, being Latin for greasy. Insects, seeds, or pollen, becoming attached by this fluid, set up an irritation of the leaf, which folds over its lateral edges slowly and secures the exciting object. The leaf then secretes an acid fluid which possesses the power of rapidly dissolving and digesting the offending substance, which appears to be absorbed by the glands that secreted the digestive fluid.

Vernal Grass (*Anthoxanthum odoratum*).

The Sweet Vernal-grass is singular among grasses in the fact that it possesses but two stamens. The panicle is spike-like, with short branches. The spikelets are one-flowered. The outer glumes are four in number, one flowering glume, a pale, but no lodicules. In the Linnæan system plants were classified according to the number of their stamens and pistils, and the artificiality of it was strikingly shown when this plant had to be widely separated from all other grasses, because it was one stamen short, though agreeing with them in all other essentials. The species is abundant in most meadows, and were it absent one of the charms of the hay harvest would be gone also; for this is the grass that gives the characteristic odour to ripe new-mown hay. It is a perennial, and flowers in May and June. It should be noted that the form which grows in meadows has purple anthers, but when this grass grows in woods it has yellow anthers. There is an introduced species, the Annual Vernal-grass (*A. puelii*), from Southern Europe and the Mediterranean region, that has become naturalized in sandy pastures from Roxburgh to Devon and Hants. It is a more slender, much-branched species, with many bent stems from the root, narrow leaves, a loose panicle, stalked spikelets, and longer awns.

The name is from two Greek words, signifying yellow blossoms.

Round-leaved Buckbean (*Limnanthemum peltatum*).

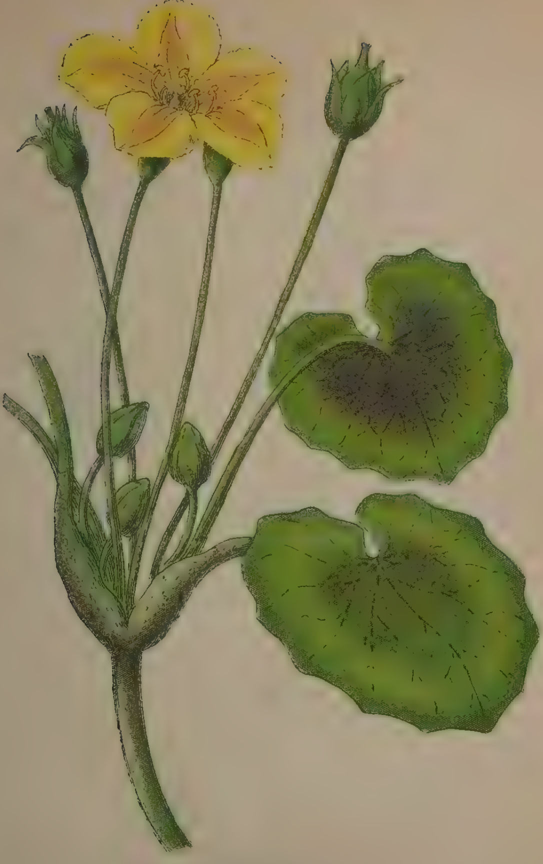
Unfortunately, this beautiful aquatic must be reckoned among our rarer plants, not merely in the sense that its natural stations are wide apart, but its entire range in this country is exceedingly limited. A line drawn from Norfolk to Oxford, thence to Sussex, will mark the western boundary of that corner of England where alone it is indigenous. It has become naturalised in a few other localities, where it has been introduced by man on account of its beauty.

It is a perennial, and has a creeping rootstock. But what might be termed the business portion of the plant floats, the roundish heart-shaped leaves lying upon the surface of the water; those from the root having very long slender stalks, but those which buoy up the flowers have much shorter and stouter stalks, which form sheaths for the umbel. These leaves are quite smooth, spotted with purple above, and purplish on the under surface. The flower stalks vary from an inch to three inches in length, each supporting a single bright yellow blossom. The calyx is divided into five slender segments. The corolla may be roughly described as a broad funnel-shape ; technically it is rotate or wheel shaped, the upper portion being widely spread. This part is also divided into five portions, so that at first sight, like the primrose, it appears to consist of five separate petals. At the mouth of the tube each segment bears a fringed scale. There are five stamens and a single pistil, ending in a two-lobed stigma. The flowers open in succession, only one being expanded at a time : July and August. The buds remain under water until the turn of one comes to open ; then that one emerges, opening on the way. When pollination has been effected, and the corolla is fading, the flower-stalk curves and brings the essential organs under water again, where the ovary develops into the flagon-shaped fruit, and the winged seeds are ripened. The fruit then opens, and the seeds rise to the surface.

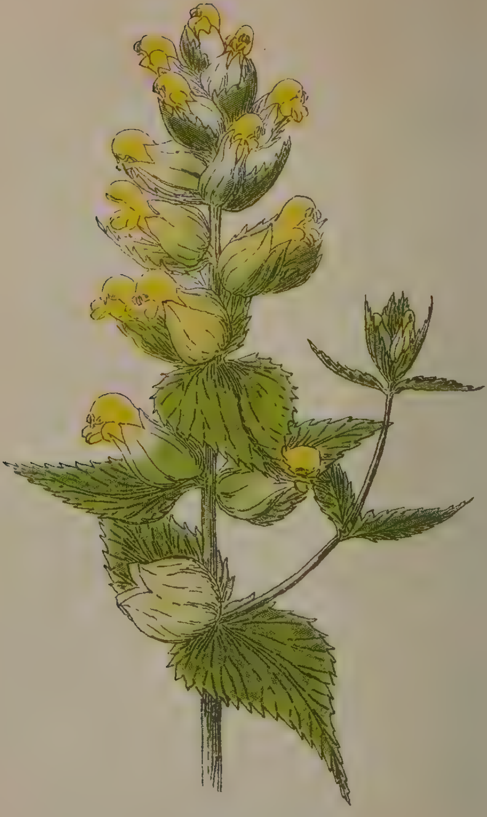
The generic name is derived from the Greek, *limne*, a pool, and *anthos*, a flower, in allusion to its partiality for still waters ; *peltatum* has reference to the shield-like form of the leaf.

Yellow Rattle (*Rhinanthus crista-galli*).

Yellow Rattle is abundant in meadows and pastures, where it is parasitical upon the roots of other plants. Its yellow flowers render it very conspicuous, and its identity is readily established by the light green inflated calyx. The stem is square ; the leaves distant, opposite, stalkless, narrow, the edges deeply toothed. The calyx is a bladder with flattened sides, and a four-toothed mouth. The corolla yellow, tubular, two lipped ; the upper lip arched over, somewhat in the form of a knight's



Round-leaved Buckbean.
Limnanthemum peltatum.
GENTIANACEÆ.



Yellow Rattle.
Rhinanthus crista-galli.
SCROPHULARIACEÆ.

casque, with two blue lobes ; the lower lip spread outward, with three lobes. There are four stamens, concealed within the upper lip ; the anthers are blue and hairy. There are two forms of flowers : a larger on one plant, a smaller on another. In the large form (shown in our plate) the calyx is relatively smaller, and the style stands well out to take the stigmas away from the anthers. In the smaller form, the corolla tube is little larger than the calyx, and, failing insect visitors, the style curves and brings the stigmas in contact with the anthers to bring about self-fertilization.

Note how well constructed this flower is for ensuring cross-fertilization. The lower lip serves as a convenient platform upon which a bee may alight. Pushing her head into the tube, it comes into contact with the stigma, for the style is curved forward to bring it in the way. The anthers are up above, under the roof, slightly attached to each other by the hairs ; but the bee, anxious to get at the honey, pushes her tongue between the filaments, and the pressure there causes the anthers to spring apart and shake their pollen down on the bee's head, where it will be ready for fertilizing the next flower it visits. The flowers will be found from May to August.

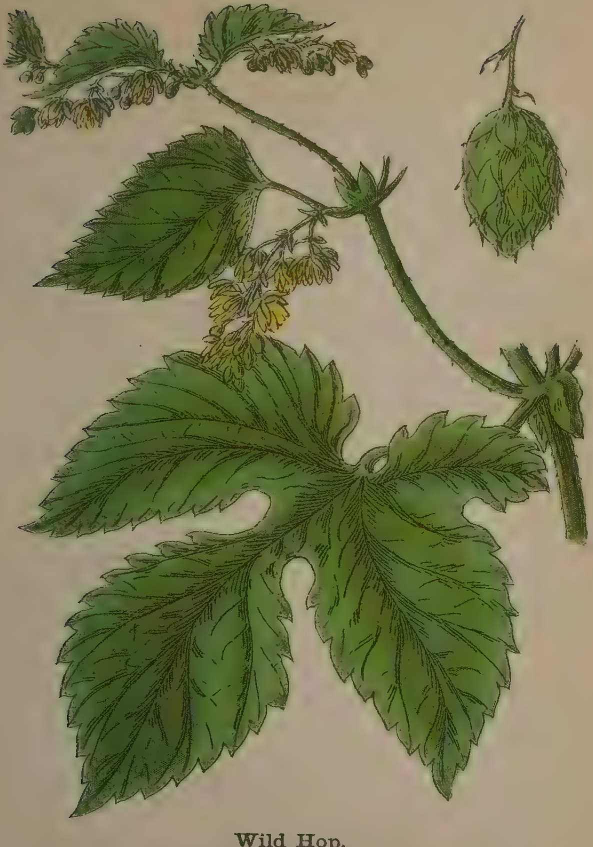
The name is from the Greek *Rhin*, nose, and *anthos*, flower, in allusion to the upper lip, which, when reversed, looks like a nose.

Wild Hop (*Humulus lupulus*).

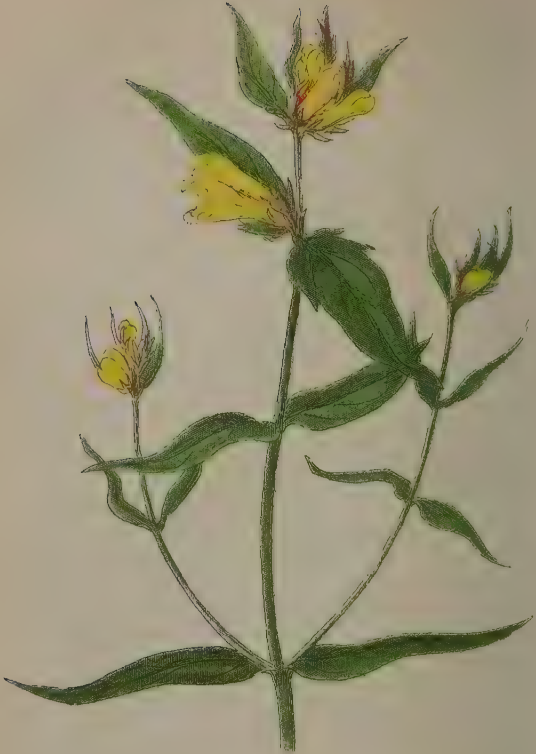
The Wild Hop may not infrequently be seen in the copse and hedgerow, especially in the south of England. North of Yorkshire and in Ireland it occurs as a naturalized plant. It has a thick branching perennial rootstock—in the cultivated plant called a "set"—from which are produced several long, thin, but tough and rough twining stems that, growing very rapidly, turn with the sun, and tightly clasp the nearest small tree or shrub. It has no tendrils like the Vine, but climbs like the Convolvulus by simply twining with the sun as it grows. Its lobed and coarsely toothed leaves are very similar to those of the Grape-vine, but very rough. The leaves are in pairs, and at the base of the leaf-stalk is a pair of long curved stipules. The Hop is what botanists term a *diœcious* plant, because staminate flowers only are produced by one individual, and pistillate only by another, making cross-fertilization imperative. It is not the insects, however, that effect this crossing in the Hop, but the wind. The flowers are all small ; the staminate produced from the axils of the leaves in long drooping panicles. They have no petals, but there are five sepals and five anthers attached to their bases. Each pistillate flower has a membranous sepal, an ovary, and two long tapering purple stigmas. Two of these pistillate flowers are produced in the axil of a green, broad, concave bract or scale. A number of these twin-flowered bracts are united into a dense spike, and after fertilization this develops into a large cone-like head of yellow scales with glands at their base, which yield a resinous substance called *lupuline*. The true fruit is a little nut, which is enclosed in the sepal under the bracts. It flowers in July and August. It is the only British species. Beside their extensive use in brewing, the flowers are frequently used to stuff pillows, their narcotic odour inducing sleep. Our plate shows a portion of the staminate or male plant, but in the upper right-hand corner the female or pistillate spike is represented.

Common Cow-wheat (*Melampyrum pratense*).

Quite a number of our common plants have been distinguished in popular nomenclature by the prefix "cow," and as a general rule it would appear to have been applied in depreciation, as in the parallel cases of "dog," "horse," and "hog," to signify coarseness or worthlessness. In the case of



Wild Hop.
Humulus lupulus.
URTICACEÆ.



Cow Wheat.
Melampyrum pratense.
SCROPHULARIACEÆ.

the Cow-wheat, our forefathers had a notion that if its seeds were ground up with wheat, the bread made from the flour would be black. One of the species (*M. arvense*) affects cornfields, and its seeds are like black grains of wheat, and from this fact the genus gets its scientific appellation from the Greek, *melas*, black, and *puros*, wheat. In addition, the plants themselves turn black when dead and dry. The flowers are fertilized by bees, which alone among the honey-seeking insects are powerful enough to open the closed lips to get access to the honey.

The native species are :—

I. Common Yellow Cow-wheat (*M. pratense*) is an annual, partially parasitic upon roots, like Eyebright. The leaves are almost stalkless, very narrow, with even margins, and produced in pairs. The flower follows the general structure of the Scrophulariaceæ. The calyx is five-toothed, the corolla tubular, straight, dilated at the mouth and two-lipped, the upper lip with the edges turned back, the lower one three-lobed. The four stamens will be found close under the upper lip, with the small stigma. It should be noticed that in this species, which is common in dry woods and on heaths, the pale yellow flowers assume a horizontal position, whilst the capsule is more deflexed. May to September.

II. Small-flowered Yellow Cow-wheat (*M. sylvaticum*) is a rare species, found in alpine woods from Yorkshire northwards. It has a small deep yellow corolla, which is borne more erectly than in *pratense*. Other points of difference will be found in the curved corolla tube, and in the position of the capsule, which is not deflexed. Flowers July and August.

III. Purple Field Cow-wheat (*M. arvense*). This is a local species whose distribution in this country is restricted to Norfolk, Suffolk, Essex, Herts, and the Isle of Wight. Where it occurs it is a conspicuous item in the cornfield flora, by reason of its large spikes of flowers with their many colours. The bracts are reddish-purple, the corolla rosy, with yellow throat, and the lips a full pink. It flowers in July and August.

IV. Crested Cow-wheat (*M. cristatum*). This also is a rare plant, confined to the Eastern Counties of England, and affecting woods, copses, and cornfields. It has broad, heart-shaped, purple bracts, with long fine teeth. The flowers in a dense spike (not so large as in *arvense*); corolla-tube curved, yellow, the upper lip purple within; September and October.

Great Reed Mace (*Typha latifolia*).

Of late years it has become the general error to call this plant Bulrush, a name which belongs by right to *Scirpus* *lacustris.* Every autumn the hawkers in London and other cities offer the cylindrical spikes of Typha for sale as æsthetic decorations, and call them Bulrushes; but they are not the originators of the blunder. It is the artists who have done this thing, for in their pictures of "The finding of Moses" they depict the future leader of his people rocking in his ark amid a forest of *Typha.* What more was needed to associate the word Bulrush of the Bible with this plant?

There are two British species, perennial plants with long narrow, grass-like leaves, the bases of which sheath the stem. The stamens and pistils are produced in separate flowers, but upon the same plant. The flowers have no perianth other than a few slender hairs. The staminate flowers occupy the upper portion of the well-known spike or "mace," and each one consists simply of several stamens joined together, the anthers opening along their sides. The pistillate flowers consist of a stalked ovary with a slender style and a one-sided narrow stigma. The specific differences are as follows:—

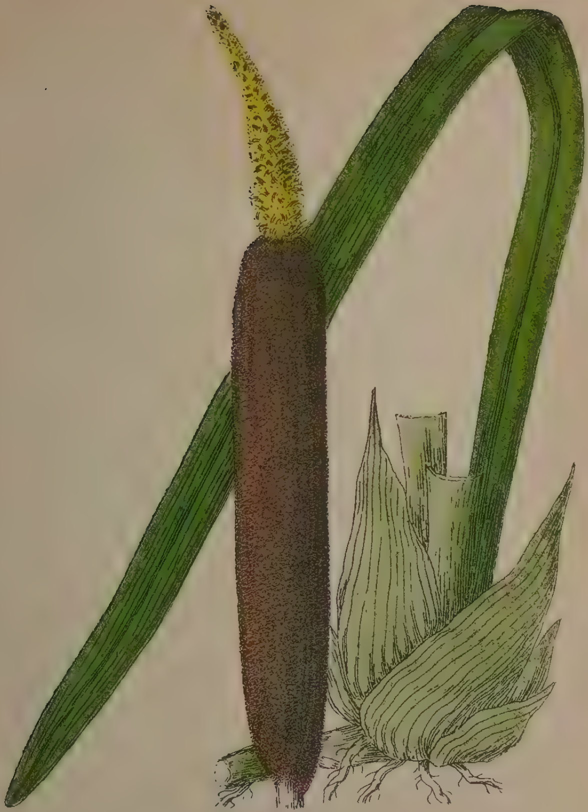
I. Great Reed Mace (*T. latifolia*). Leaves as much as 1½ inch broad, in two rows, bluish-green. Flowering stem naked, 6 or 7 feet high. Staminate and pistillate spikes continuous, or but slightly interrupted. Growing in lakes and on the banks of rivers. Flowering in July and August.

II. Lesser Reed Mace (*T. angustifolia*). Whole plant smaller. Leaves half the width, dark green, grooved at lower end. Staminate and pistillate spikes separated by an interval. Stigmas broader. Ditches and pools. Less common than *latifolia.* Flowering in July.

The name is from the Greek, *tiphos*, a fen or marsh, from the habitat.

Felwort (*Gentiana amarella*).

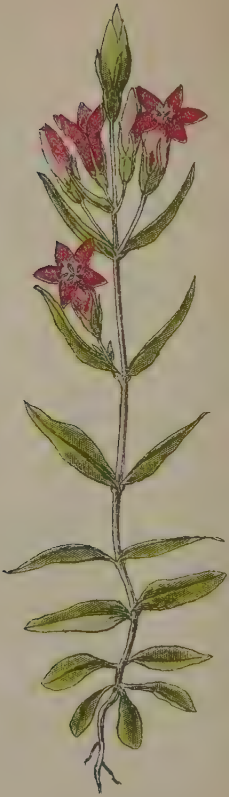
The Gentians are all beautiful flowers, and some of the Alpine species arouse the enthusiasm of climbers in the European Alps. There are five species inhabiting these islands, and we have selected the most widely distributed as a type. It is an annual herb that must be sought in dry pastures and on chalk downs, where it may easily be passed over as *Campanula*



Great Reed Mace.
Typha latifolia.
TYPHACEÆ.

2 *Pl.* 82

G 94



Felwort.
Gentiana amarella.
GENTIANACEÆ.

2 *Pl* 83

G 95

glomerata (*see* page 48). It flowers from July to September. Its stature varies from 4 inches to 1 foot. The radical leaves are spoon-shaped ; those of the stems lance-shaped and opposite. The stem branches above and bears the numerous pale purple flowers in panicles. Individually the flowers have the sepals united into a five-lobed calyx, the petals similarly joined in a five-lobed corolla ; there are five stamens and a two-lobed stigma. Within the throat of the corolla there is a fringe of hairs. The species consists of two forms or sub-species, which were formerly ranked as entirely distinct. *Amarella* proper has the lobes of the calyx nearly equal, and half as long or quite as long as the corolla-tube ; and there is an early flowering variety of this (var. *præcox*), with the flower parts in fours and the calyx-lobes unequal. The sub-species *germanica* is a larger and stouter form than the other, with larger flowers ; two of the calyx lobes are broader and sharper than the others, and none are so long as the corolla-tube.

The other British species are :—

I. Field Gentian (*G. campestre*). Annual, similar to *amarella*, but flower parts in fours, calyx more deeply divided, the lobes very unequal, the two broader overlapping the much narrower inner ones. Corolla 1 inch, pale lilac, occasionally white. Moist pastures ; more frequent in the north. July to October.

II. Marsh Gentian (*G. pneumonanthe*). Perennial, 1 to 2 feet, stems slender, branched but slightly. Calyx with two bracts ; lobes five, equal. Corolla 1½ inch, trumpet-shaped, bright dark blue within, dull blue with green stripes on outside, no hairs in throat. Moist heaths ; local and rare. August and September.

III. Spring Gentian (*G. verna*). Perennial, 2 inches, root-leaves forming rosettes, stems in tufts, each terminated by a solitary, bright blue, salver-shaped flower, 1 inch across. May and June. Rare and local, on wet limestone rocks in North England and North-West Ireland.

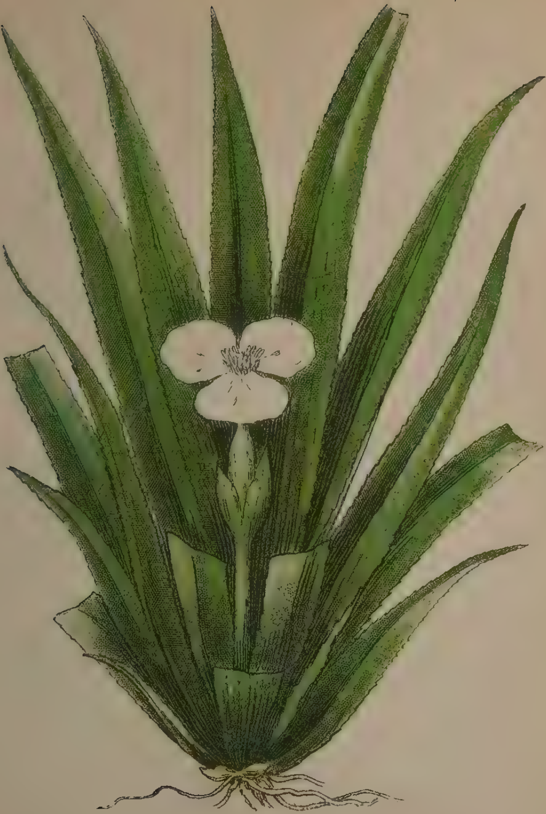
IV. Small Alpine Gentian (*G. nivalis*). Annual, 2 to 8 inches, stem slender, flowers few or solitary, funnel-shaped, blue. Very rare. Recorded only from the hills of Breadalbane and Clova. August and September.

The genus name *Gentiana* is Latin, and is the same as was used by the ancients for these plants. Felwort probably signifies that its astringency has been utilised by the tanner.

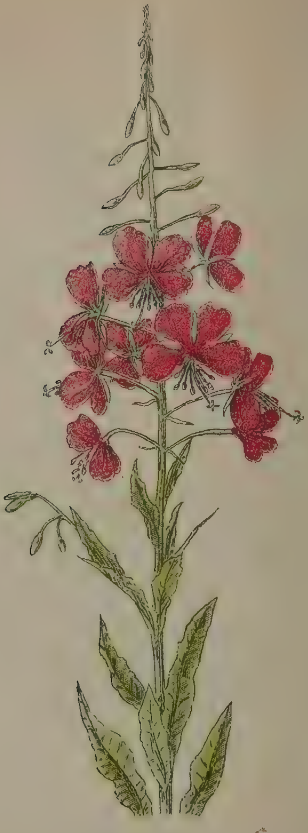
Water Soldier (*Stratiotes aloides*).

Closely allied to the Frogbit (see page 123) the Water Soldier resembles it in the flower, but is as unlike as possible in the leaf. The Frogbit is unattached to the soil and floats freely without impediment. The Water Soldier roots in the bottom only after flowering. The leaves all spring from the rooting base, and are sword-shaped, thin, though stiff and brittle. Their edges are cut into bold teeth with sharp points, and they are channelled down the centre. Of necessity they are figured as erect-growing, but in fact they spread outwards on all sides from the centre, a habit which, combined with their prickly edges, has got the plant its alternative name of Water Aloe. The flowers are an inch and a half across, and consist of a three-parted calyx, and three white petals. Beyond this individual flowers will be found to differ in the fact that some have an egg-shaped ovary with six styles, which are each split into two at the apex. In this form the stamens are imperfect and bear no anthers, but they secrete nectar. In the other form, where of the numerous stamens twelve are perfect, there are three rudimentary pistils. The pistillate flower is solitary, but two or three of the staminate flowers come from the same envelope. The pistillate flower is succeeded by a green flagon-shaped, six-celled berry which curves over until it is at right angles to the flower-stalk

The development of the seed-vessel, and the ripening of the slimy coated seeds, takes place under water as in the case of Round-leaved Buckbean. After flowering, the plant descends to the muddy bottom for this purpose, and sends out runners with buds from between the leaves, so that after a little while the old plant is surrounded by a circle of attached young ones. Early in the autumn the whole family rises to the surface once more, where the runners decay and set the young plants free. Before the winter they all descend again for hibernation, and



Water Soldier.
Stratiotes aloides.
HYDROCHARIDACEÆ.



Rose-bay Willow-herb.
Epilobium angustifolium.
ONAGRACEÆ.
(Reduced one-half.)

2 *Pl.* 85 *H* 9

no more is seen of the Water Soldier until the general spring impulse brings them to the surface to put out fresh leaves and prepare for flowering, which takes place from June to August.

The Water Soldier is a plant of still waters.

Rose-bay Willow-herb (*Epilobium angustifolium*).

The Rose-bay or French Willow is a woodland plant, often covering extensive areas by means of its creeping underground shoots. Travellers on the South-Western main line between Weybridge and Woking must often be delighted by the flowering of this plant in the pine woods through which the railway runs. In other woods one may often come across a glade that appears to be blocked by the straight close-ranked stems, 4 feet high, surmounted by the elegant racemes of rosy flowers.

The stem is smooth and unbranched ; the leaves lance-shaped, faintly toothed, shortly stalked, alternate, glaucous beneath. The flowers are about 1 inch across, irregular, though they do not appear to be so. There are four purple sepals occupying the space between the claws of the rosy-purple petals, which are not opposite, as in most four-parted flowers, but paired irregularly : No. 1 pairs with No. 4, and No. 2 with No. 3. Between 1 and 4 there is a considerable gap, but it is filled by the eight down-bent stamens, of which four are long and four short. When the flower opens, the anthers shed their pollen, and their disposition makes them a convenient alighting-place for insects seeking honey. Until all the pollen has been shed the short style is curved sharply downwards among the bases of the stamens to keep it out of the way ; then, however, it quickly elongates, and its clubbed head separates into four long arms—the stigmas, which at first spread widely in the position previously occupied by the anthers, which have now shrivelled and turned back out of the way. Should the stigmas not soon receive pollen from a visiting insect, the petals fold over the stamens, and leave the stigmas—now curled back round the style—alone exposed and showing white in strong contrast against the closed petals. The unopened buds bear themselves gracefully in various attitudes on the upper part of the raceme. After fertilization, what appeared to be the long stalk of the flower enlarges until it is stout, square, and 3 or 4 inches long. It is really the stalked ovary, and in due time it splits open and reveals the egg-shaped seeds, each terminating in a tuft of the finest, most delicate silken filaments of great length, which buoy them up as the breeze picks them out of the open capsule.

The Rose-bay may be found flowering during July and August in damp woods and copses in almost all parts of the three kingdoms, except Cornwall.

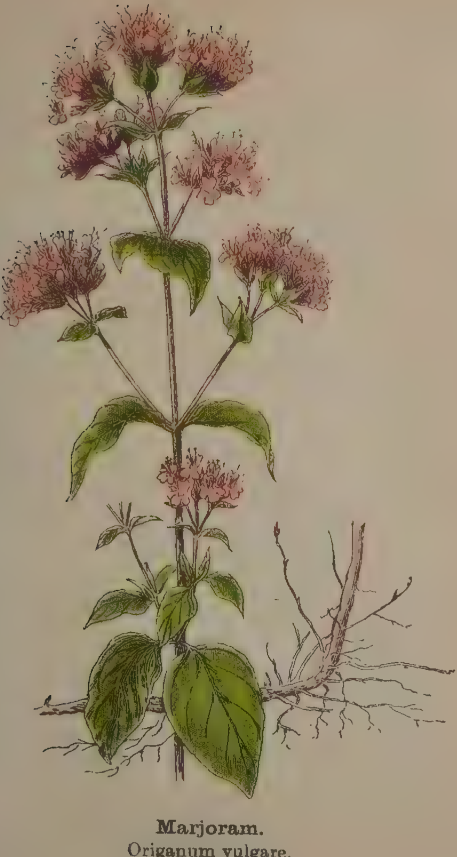
There are nine other British species, which all differ from the Rose-bay in having regular flowers which do not spread open widely, but assume a bell-shape or funnel-shape. The flowers are all solitary from the axils of the leaves, and never in terminal racemes, as in the Rose-bay. They also have the calyx-lobes joined at their base, and the stamens are erect instead of bending down. The most generally distributed of these are the following :—

I. Codlins-and-cream (*E. hirsutum*) is a tall (3 or 4 feet) rank plant that grows beside ditches and streams, with fleshy, creeping rhizomes, and stalkless broad-lance-shaped leaves with small saw-like teeth. Flowers rosy-purple, ¾ inch across ; anthers and stigmas mature at same time ; petals broad, with notched margin ; July and August. Odour of flowers indicated by the common name.

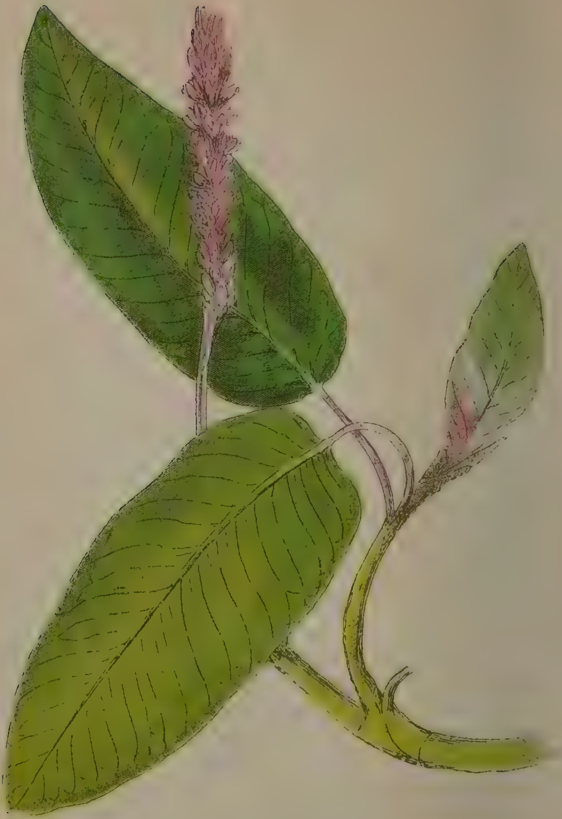
II. Small-flowered Willow-herb (*E. parviflorum*). Somewhat similar to the last, but branched in upper part of stem only ; leaves lance-shaped, stalkless ; flowers ⅓ inch, rosy-purple ; stigma lobes short and not curled back ; July and August on river-banks and beside ditches. Flower-buds erect.

III. Broad-leaved Willow-herb (*E. montanum*). Stem downy, erect, 1 to 2 feet. Leaves with short stalks, broad lance-shaped, opposite, or in whorls of three. Flower-buds drooping ; flowers ⅓ inch, pale purple, stigma lobes as in II. ; June and July, on shady banks and walls.

IV. Square-stalked Willow-herb (*E. tetragonum*). Stem erect, branched, 1 or 2 feet high, angled or with two or four raised lines. Leaves small, slender lance-shaped, mostly stalkless. Flowers ⅓ inch, rose-lilac, inconspicuous ; July and August. Wet places in woods, fields, lanes, etc.



Marjoram.
Origanum vulgare.
LABIATÆ.



Amphibious Buckwheat.
Polygonum amphibium.
POLYGONACEÆ.

V. Marsh Willow-herb (*E. palustre*). Stem rounded, downy; leaves lance-shaped, soft, mostly opposite. Buds nodding; flowers ⅓ inch, rose-lilac; July and August. Bogs and marshy places. In this species the runners, which are common to all the species, form bulbs at their extremities in autumn, which become detached and form new plants.

There are a great number of natural hybrids between the species, which at times may cause difficulty.

The name of the genus is from two Greek words, *epi*, upon, and *lobion*, a pod, from the position of the flower above the incipient capsule.

Marjoram (*Origanum vulgare*).

The name and the figure recall visions of high, rounded banks to a deep lane in the chalk districts of Surrey, when the hot air of July is heavily laden with the sweet aromatic odour of Marjoram, and the banks densely clothed with the plant, and its broad bunches of purple flowers swarming with long-winged beetles and other insects.

A glance at the illustration shows this to be a true Labiate in all its details. It has a short rootstock, from which runners proceed; the leaves have short stalks, and are usually entire, but sometimes have blunt teeth. As a rule, the bracts below the flowers are coloured purple, but are sometimes green. The calyx is dotted with yellow, and has short teeth. The corolla is ordinarily purple, but on some plants the flowers are much smaller, and also of a paler tint—it is, in fact, *dimorphic.* The larger kind bear both stamens and pistil, the stamens maturing first (*proterandrous*) to ensure cross-fertilization. In the smaller kind only the pistil is developed, and here again, of course, cross-fertilization must take place; the species, in fact, has entirely lost the power of self-fertilization, but the showy heads of bloom, the abundant honey, and the aromatic odour quite do away with the necessity for it, for insects swarm upon it, and unconsciously perform the task of pollen-carriers. The plant flowers from July to September. This is the only British species, and the name is made up from two Greek words, *oros*, a hill, and *ganos*, brightness, from its giving brightness to hilly places.

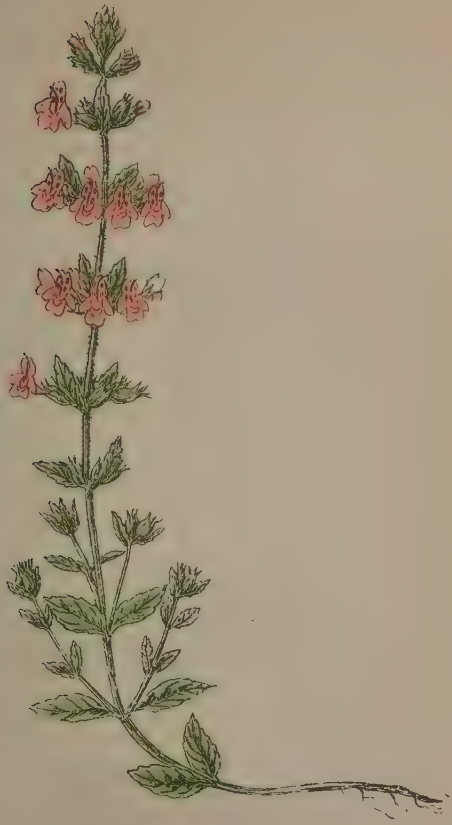
The Buckwheats (*Polygonum*).

In the neighbourhood of manure-heaps and on the borders of cultivated ground one may come across the Common Buckwheat (*Polygonum fagopyrum*), which was formerly included in the British Flora, but is now known to be a mere waif of cultivation. Its home is in Central Asia, but it has been so long cultivated as a food-plant in Europe and in the United States that it has become naturalized in most places. In this country it is chiefly grown as a food for pheasants. It is an annual, with a tall, slender, branched, reddish stem, and heart-shaped, almost arrow-headed leaves with entire margins. Flowers in panicles. The individual blossoms consist of five pale reddish sepals, no petals, eight stamens, and three styles. The flowers are of two forms, one with long stamens and short styles ; the other with short stamens and long styles. The fruit is large, three-sided, solitary in a nut, very like beech-mast, whence its folk-name *buch-* or buck-wheat. It will be noted that at the base of the leaf-stalk is a pair of thin stipules, which sheathe the stem and mask the swollen nodes that give the knotted appearance so characteristic of the genus, and which has given it the name of many knees or joints (Greek, *polus* and *gonia*). Buckwheat flowers during July and August. It is a valuable honey-plant, esteemed of bee-masters. There are a dozen British species ; among them :—

I. Bistort or Snake-root (*P. bistorta*). Perennial, with large twisted rootstock. Radical leaves long, egg-shaped, the upper part of the leaf-stalk winged. Stem-leaves almost stalkless, broader near the stem. Flowers pink or white, producing honey ; moist meadows. June to September.

II. Amphibious Buckwheat (*P. amphibium*). (*See* Plate 87.) Perennial, rootstock sometimes creeping in the ground, at others floating in the water. If the plant is floating the leaves have long stalks ; if growing on land they are almost stalkless. Stipules tubular, large, smooth in water, bristly on land. Stamens five, styles two. Flowers, rosy-red. July and August ; margins of pools and in other wet places.

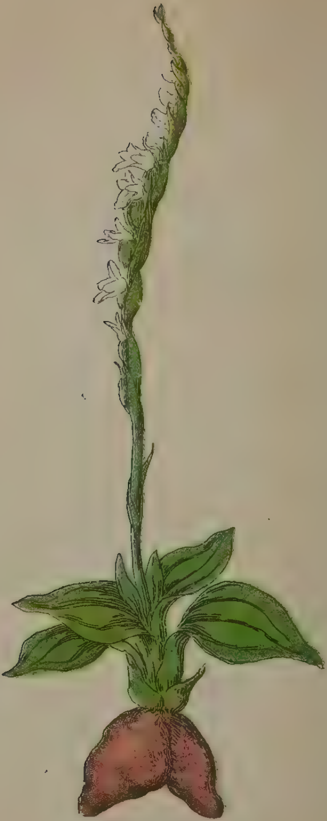
III. Spotted Knotweed (*P. persicaria*). Annual. Stem erect ; leaves long, narrowly lance-shaped, with a black heart-shaped patch in the centre, downy



Basil Thyme.
Calamintha acinos.
LABIATÆ.

2 *Pl.* 88

H 101



Lady's Tresses.
Spiranthes autumnalis.
ORCHIDACEÆ.

beneath; the stipules fringed with a few long hairs. Flowers flesh-coloured; stamens six, styles two. July to October, in moist places.

IV. Black Bindweed (*P. convolvulus*). Annual, with twining stems. The leaves are very similar to those of the true Convolvulus, the lobes more pointed; stipules short. Sepals green, with paler margins. Fields and wastes. July to September.

Other species will be found under Knot-grass (page 104).

Basil Thyme (*Calamintha acinos*).

Basil Thyme is not likely to be included in any popular list of the Hundred Best Wild-flowers, although so far as beauty is concerned it has full claim to such distinction. But it has the disadvantage of being comparatively unknown, although by no means an uncommon plant. Those whose rambles are taken in the uplands during July or August should have no difficulty in meeting with it in dry fields and on chalk downs. The grasses are then long, and many taller plants, such as Scabious, Hard-heads, and Musk-thistle, divert attention from the more lowly plant that grows beneath their aspiring heads, for our Plate shows the ordinary full stature of the plant.

It is an annual or biennial downy plant of the Labiate family, with a stem about 6 inches long that leans upon the ground for a couple of inches or so before rising into the air. Its shortly stalked oval leaves are slightly toothed and pointed, and it has leafy bracts under the whorls of bright blue-purple flowers, which are rendered the brighter by their spots of white and dark purple. It is generally distributed throughout England, but rare in Scotland and Ireland.

There are two other British species :—

I. Calamint (*C. officinalis*). A tall hairy perennial (3 feet) with creeping rootstock giving off runners. Stem with long branches. The oval leaves have round-toothed edges. The flowers are red-purple veined with white, in one-sided whorls, appearing from July to September, on dry soils as far north as Westmoreland and in Ireland. There are two sub-species—*C. nepeta*, with short erect branches, small leaves (½ to 1 inch) with pale undersides, and small corollas (⅓ inch), with broad middle lobes to the lower lip, rare; *C. sylvatica*, with large leaves (1 to 3 inches) and large corollas (¾ to 1 inch), with middle lobe of lower lip no broader than the side lobes. Found on chalk in Hants, Devon, and Isle of Wight.

II. Wild Basil (*C. clinopodium*). A perennial clothed with soft hairs. Rootstock woody with runners. Stem slender, with few if any branches, 1 to 3 feet. Leaves oval, slightly toothed, distant, 1 to 2 inches. Flowers purple, hairy, 1 inch; upper and lower lips almost equal. July to September, in copses and rocky places as far north as Banff and Renfrew; rare in Scotland and Ireland.

The name of the genus is from two Greek words, *kalos*, beautiful, and *mintha*, mint.

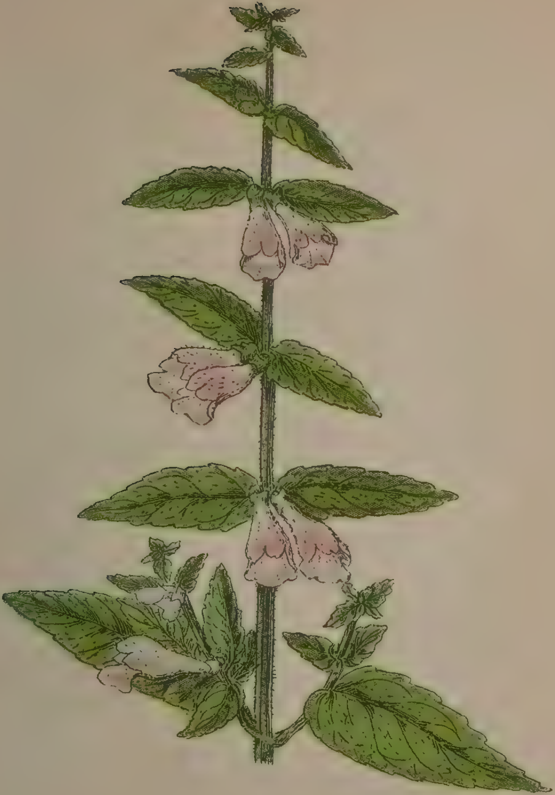
Lady's Tresses (*Spiranthes autumnalis*).

In upland pastures where in September the grass has all turned yellow and dry, the rambler may be surprised to find springing from it an upright leafless spray of small white flowers, which are all turned in one direction and are sweet-scented. This is the Lady's Tresses Orchis. A peculiarity of this plant is that, though it bears leaves and flowers at the same time, they are not connected. There are two or three egg-shaped tubers, and from the top of these in early autumn is produced a rosette of oval leaves. Next summer these leaves will be all dry and withered, and then will rise the downy flowering stem, from 4 to 8 inches high. When the flowers are expanded, another rosette of leaves will make its appearance at one side of the flower-spike. And so they proceed year by year.

The fragrant flowers are quite small—only $\frac{1}{8}$ inch across—and never open widely, both sepals and petals maintaining an erect attitude. Each flower is sheathed by an inflated, pointed bract. As in Twayblade and Bird's-nest Orchis, the anther is hinged to the back of the column. It is two-celled, and contains four powdery pollen-masses. There is no spur in this genus of Orchis.

There are three other native species, all rare:—

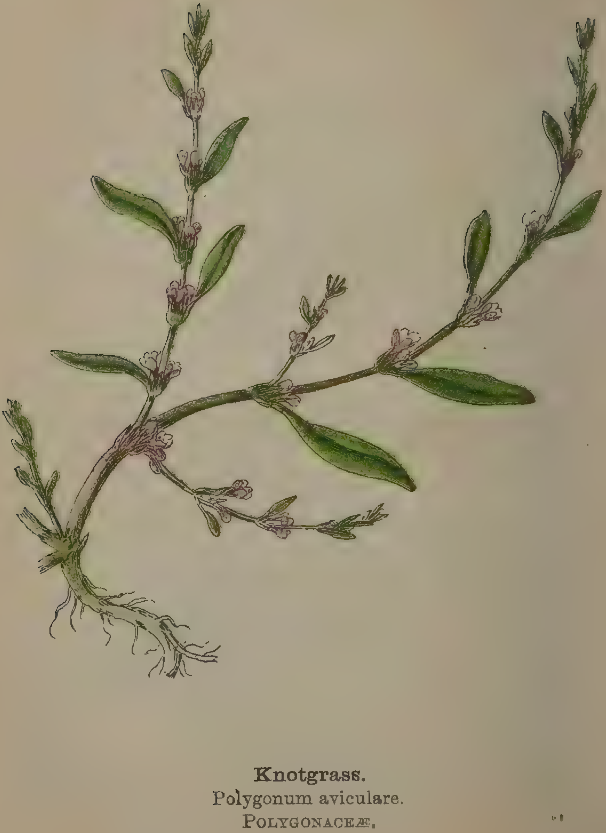
I. Summer Lady's Tresses (*S. æstivalis*), with cylindrical tubers, and radical leaves round the base of the flowering stem. Affecting boggy places instead of dry fields. In other respects similar to the previous species, but larger; 6 to 18 inches high, leaves slender, flowers and bracts larger. Not fragrant. Its only known



Skull Cap.
Scutellaria galericulata.
LABIATÆ.

2 Pl. 90

H 102



Knotgrass.
Polygonum aviculare.
POLYGONACEÆ.

localities are in the New Forest, Hants; Wyre Forest, Worcestershire; and St. Ouen's Pond, Jersey. Flowering in July and August.

II. Cork Lady's Tresses (S. *Gemmipara*). Tubers cylindrical; slender leaves in tuft around, stem and a few feet above. Stem 5 or 6 inches high. White fragrant flowers in three rows with overlapping bracts: July. Cork and Kerry bogs.

III. Rydberg's Lady's Tresses (*S. stricta*). Tubers stouter; leaves longer; stem a foot high, more closely wrapped by leaves; spike less dense, but flowers larger with stronger yellow lines on lip: July and August. Lough Neagh, Ireland.

Skull-Cap (*Scutellaria galericulata*).

Along the banks of rivers, and in marshy places, from July to September, the Skull-cap attracts attention by the beautiful blue of its corollas. It is a perennial plant with a creeping rootstock from which the spare stems rise to a height of 1 or 2 feet, bearing at intervals opposite leaves, and from the axil of each leaf a flower. The leaves are oval-lance-shaped with very short stalks, and the margins cut into rounded teeth. The really opposite flowers turn their mouths in the same direction, so that they become a pair, and as their interiors are coloured a much paler blue they have a very pretty and striking effect with their half droop. The calyx is bell-shaped, two-lipped, the upper lip having at its back a broad, hollow pouch, and from the dish-like (*scutella*) character of the depression the genus gets its name. The tubular corolla is $\frac{2}{3}$ of an inch long, which is three or four times the length of the calyx, getting broader towards the mouth. There are four stamens, each with a pair of anthers, and they will be found under the roof of the corolla, with the two-lobed style between them.

There is another native species, the Lesser Skull-cap (*S. minor*), which is similar but smaller, with a more slender, more branched stem, 4 to 6 inches long; the leaves not more than 1 inch long and with only one or two teeth at their base. The flowers are only $\frac{1}{3}$ of an inch, of a pale purple tint, the lip dotted with dark crimson. It flowers from July to October, and may be seen on swampy heaths and the banks of ditches.

Knot-grass (*Polygonum aviculare*).

Though the Knot-grass may be found in most fields, it is in neglected gardens and waste places that it chiefly abounds. It is an annual, but long-lived as annuals go, for these usually die soon after ripening seed. Knot-grass, however, produces seeds, and its newer branches continue to flower, so that its flowering season is prolonged from May to October. Its slender, straggling, prostrate stems branch off in all directions from the root as a centre, and stretch away from it for 3 feet or more, becoming a favourite resort for a small beetle with shining blue back and red thorax. The alternate leaves are very variable, more or less slender lance-shaped with small silvery-white stipules, looking as though torn, and red at the base. The "knots" of its name are provided by the small pink or crimson flowers which are in the axils of the leaves. Sometimes these flowers are white, sometimes green, but pink is their more usual hue. We have already described the flower-parts of the *Polygonums* (*see* page 100), and there is no departure from the prevailing type here. They are self-fertile, like Chickweed. The fruits are brown, finely scored and dotted; they are much esteemed by birds as a food. The entomologist who is rearing the larvæ of the moths called Geometers finds a valuable ally in this plant when the usual food of the species cannot be got at, for most of them will gladly eat Knot-grass.

In addition to the species of the genus described on pages 100 and 101, we may mention :—

I. Seaside Knot-grass (*P. maritimum*) is a similar plant to the common species, but more woody and stouter, being a perennial. Its leaves are much thicker, and on the underside they are glaucous, and the nerves form a network. Stipules, flowers, and fruit are alike larger. It flowers from July to September; but it is much more restricted in its distribution, being found only at certain places on the shores of Hampshire, Devon, Cornwall, and the Channel Islands.

II. Pale-flowered Persicaria (*P. lapathifolium*). This and the next species are more closely allied to the Buckwheats than to the Knot-grass. It is an annual with a more or less ruddy stem several feet long, partially resting on the ground, but not prostrate, rooting at the lower knots. The oval or broad lance-shaped leaves have short stalks, often with a black blotch on the upper side; the loose stipules sometimes fringed. The pale, greenish flowers are borne in stout cylindrical racemes, and appear in July and August, in fields and wastes.

III. Water Pepper (*P. hydropiper*). An annual of common occurrence by ditches, streams, and other moist places, with more or less erect, branched stems (2 feet) and swollen knots. Leaves lance-shaped, scarcely stalked, often with a black blotch, downy beneath. Flowers red or white in cylindrical racemes, 1½ inch long; July to October.

Great Reed (*Phragmites communis*).

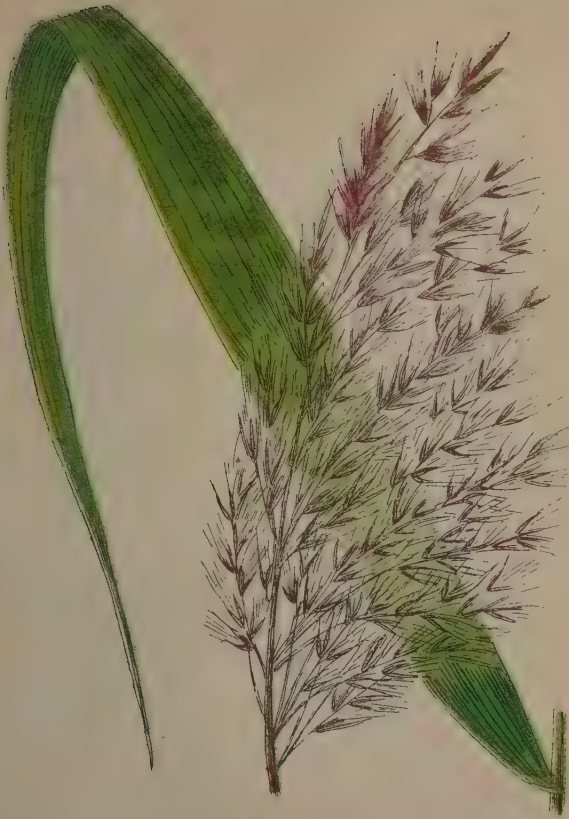
The Reed is our giant grass, often towering to a height of 10 feet, and forming extensive "reed-beds" in fens, and on the margins of lakes and rivers. Many a wild creature finds a home in its sheltering jungle, and one bird—the reed-warbler—not only chooses it as a suitable spot in which to build, but uses the leaves and stems of the Reed to be woven into a light but safe and bulky basket-nest. There is an extensively creeping rootstock, which is jointed like a length of bamboo, and from which the thick round stems shoot straight up. The leaves are from ½ to 1 inch wide, flat, stiff, and sharp-pointed, their edges bristly, and the undersides glaucous. The panicle is very large and soft (from 1 to 1½ foot in length), somewhat oval in outline, dense though soft and nodding, of a purple hue. The spikelets are half-round, glossy, containing three flowers or five, and two short, unequal, empty glumes. The flowering glumes—except the lowest in each spikelet—are surrounded by long silky hairs as long as the glumes. The flowering time is July and August; and the plant will be found generally distributed throughout the three kingdoms. This is the only species. The name is said to be derived from the Greek word, *phragma*, a fence or enclosure, on the ground that the stems of Reed may be used for this purpose. Probably primitive man may have used them for such a purpose, and for making rude temporary shelters. They are still used for thatching roofs in some country districts where they abound.

Gipsy-wort (*Lycopus europæus*).

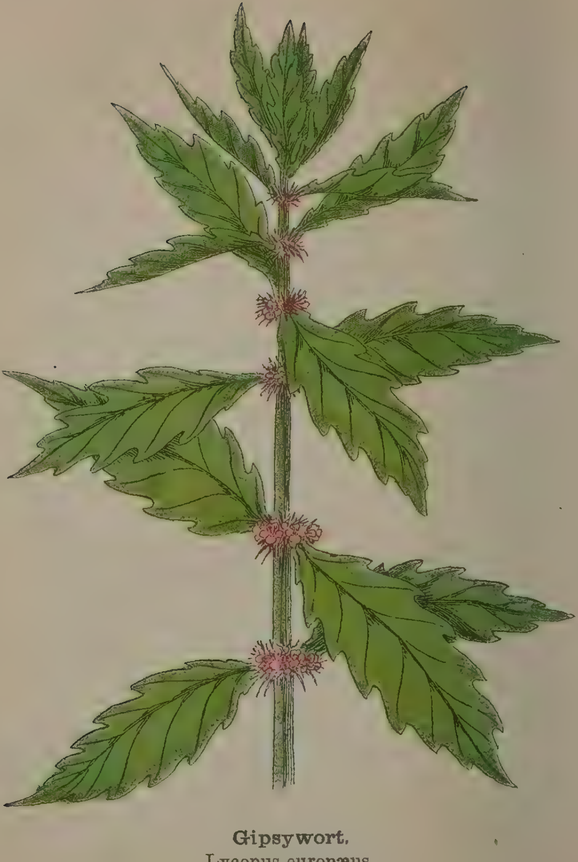
Around the margins of ponds, along the banks of ditches and streams, the Gipsy-wort may often be found amongst the crowded vegetation of such places. But it is the leaves more than the small flowers that are likely to first attract attention. The perennial rootstock either creeps or sends out runners. The sharp square stem rises to a height of 3 feet. The opposite leaves are elliptical, with very brief stalks, and their margins are deeply cut in a manner that suggests the leaves of Turkey Oak (*Quercus cerris*). It is said that the scientific *Lycopus*, or Wolf's-foot, was suggested by the form of the leaf, but the likeness does not strike us as a very obvious one. Words of similar meaning are in use as popular names in several European countries, which appear to indicate a common origin. We may suppose that Tournefort in naming the genus simply adopted the Greek equivalents of the names that were in general use in the seventeenth century, and that forces us to the conclusion that the popular imagination was very acute in those days to detect such a likeness.

The small stalkless flowers are produced in dense whorls from the axils of the leaves. Both calyx and corolla are bell-shaped, the latter bluish-white dotted with purple, which gives a pinkish effect. There are four stamens, of which two are imperfect, the perfect ones keeping away from the two-lobed style, and discharging their pollen before the stigmas are mature. It flowers from June to September, and is generally distributed, though less frequent in Scotland than in England, etc.

The popular name Gipsy-wort appears to be due to the fact that its juices afford a rich brown stain. It is said that when a pale town loafer goes on tramp and wishes to pass as one of the gipsy tribe, he uses the juice of this plant to give the requisite tint to his complexion. This is the only British species.



Great Reed.
Phragmites communis.
GRAMINEÆ.



Gipsywort.
Lycopus europæus.
LABIATÆ.

2 Pl. 93

H 107

Autumn Crocus (*Crocus nudiflorus*).

The Crocus is associated in the minds of most of us with the spring and the garden ; yet there is a Crocus that is wild in the meadows of the English midlands, and it flowers not in spring but in September and October. But there are doubts cast upon its claim to be regarded as a true indigene. Its home is in Spain and the south of France, and it appears most likely that it has escaped from cultivation, and spread in a state of freedom over a small extent of country which includes Warwickshire and Shropshire in the south, and Yorkshire and Lancashire in the north. However, the Autumn Crocus does grow wild in the district indicated, and the vernal Purple Crocus of our gardens is similarly enjoying a life of freedom in meadows in Berkshire, Middlesex, Suffolk and Nottingham.

The Autumn Crocus, like our garden species, arises from a solid underground corm which is clad in a thin coat of rich brown straight fibres. From this corm arises in September a solitary flower bud, wrapped in a delicate spathe, without the intervention of any stem; neither are there at this time any leaves. The lower portion of the flower is a very long and slender silky tube, which dilates upwards and divides into the six bright purple perianth lobes which show no distinction between sepals and petals, except that three are outer in the bud and three inner. To the lower face of these outer lobes the three stamens are attached. The ovary is down below, close to the corm, and the thread-like style reaches up to the opening of the flowers, where it divides into three wedge-shaped, orange stigmas with lacerated edges. Though the pale orange anthers stand on the same level as the stigmas, they open to discharge their pollen outwardly, and so give the stigmas a chance of fertilization by pollen brought from another flower.

In the following March the leaves appear above ground, and continually lengthen until they have made sufficient new material to form a new corm and feed the spindle-shaped capsule full of small red seeds, that lies in their embrace. The leaves wither, the capsule opens and scatters the seeds.

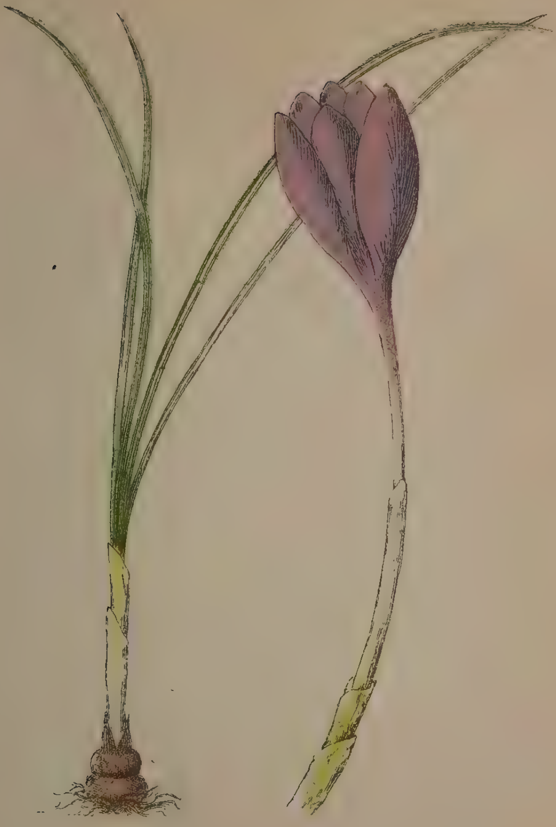
The Purple Crocus (*C. vernus*), referred to above, and well known as a favourite garden flower, produces leaves and blossoms at the same time (March).

The genus bears the old Greek name of these flowers.

Wild Thyme (*Thymus serpyllum*).

The Wild Thyme grows on the hills and the high heath lands, usually among fine grasses that are close-cropped by sheep and rabbits; or if on lower ground it will probably be found upon the light and well-drained soil of a mole-hill, among mosses. In spite of its diminutive stature it is a shrub, with a woody roodstock and a creeping stem, from which arise the flowering stems. The leaves, which are very small and stalked, are egg-shaped, with even margins, often turned under. The rosy-purple flowers are produced in spikes—or rather in whorls which are so closely massed together as to resemble a spike. They are of the usual *labiate* type, and both the calyx and the corolla are two-lipped. The upper lip of the calyx is three-toothed, the lower cleft in two, the whole of a purplish hue. The upper lip of the corolla is straight and notched, the lower cut into three lobes.

There are two forms of flower—smaller and larger; the small are perfect, the larger bearing developed anthers only. It should be noted also that in the complete flowers the anthers shed their pollen before the stigmas are ripe; self-fertilization is therefore impossible. The flower produces much honey, the whole plant is highly fragrant, and in consequence is very much visited by insects who carry the pollen. While the stamens are ripe the pistil is short and almost hidden within the corolla-tube; when the pollen has been shed the style elongates, the



Autumn Crocus.
Crocus nudiflorus.
IRIDACEÆ.

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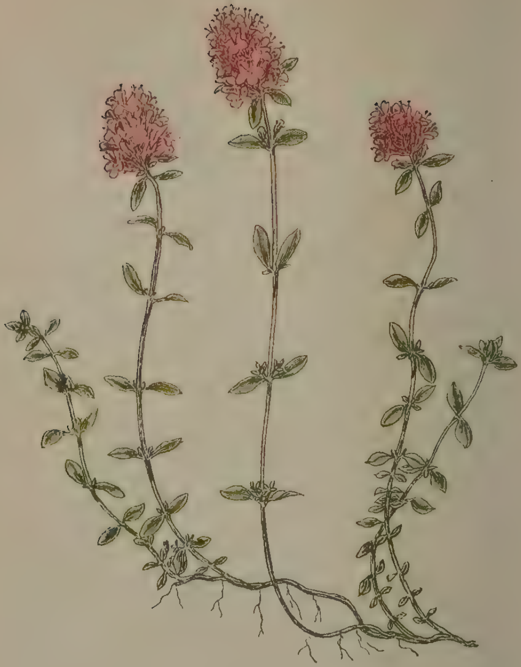


Thyme.
Thymus serpyllum.
LABIATÆ.

two arms of the stigma diverge and occupy a prominent position far outside the lips. Under this arrangement insects alighting on the younger flowers dust themselves with pollen, and upon visiting those a day or two older could scarcely fail to deposit some of it upon the ripe stigmas.

There is a sub-species (*T. chamædrys*) distinguished by all the stems being alike—at first spreading, then rising, the stems that were barren this year ending in a flowering shoot next year; the leaves less narrowed into the stalk; the flower-whorls in many heads in the axils, and the upper lip of corolla short, broad, and semicircular.

This is the only native species of a genus named from the ancient Greek name for the plant.

Yellow Archangel (*Lamium galeobdolon*).

The Yellow Archangel or Weasel-snout is really one of the Dead Nettles (*see* page 113), but it has escaped getting that name, probably because its leaves are much narrower than those of the Nettle. It is a perennial plant, that is found more in the copse and bushy hedgerow than on the roadside waste, where the other species are plentiful. The plant increases partly by means of runners from the rootstock. The flowering stem is about 2 feet high; others which do not bear flowers run along the ground. They are square, and bear opposite, oval, stalked leaves, 1 or 2 inches long, with rounded teeth. The flowers are in distant whorls—from six to ten in each—and are yellow. The corolla has a short tube, and the two long lips are distended, the upper vaulted, the lower three-lobed and spotted with brown. They appear in May and June. The stamens and style follow the curvature of the upper lip, against which they lie.

The name Archangel cannot be satisfactorily explained, and appears to be a merely extravagant arbitrary term bestowed by the monks, possibly from some supposed angelic virtues possessed in a superlative degree. Weasel-snout is due to some fancied resemblance between the upper lips in profile and the fore part of a weasel's head. Such resemblance can be seen sometimes when the name is explained, but it is scarcely so strong as to be noticed without suggestion. The name of the genus is from the Greek word *laimos*, and alludes to the throat-like constriction of the corolla-tube.

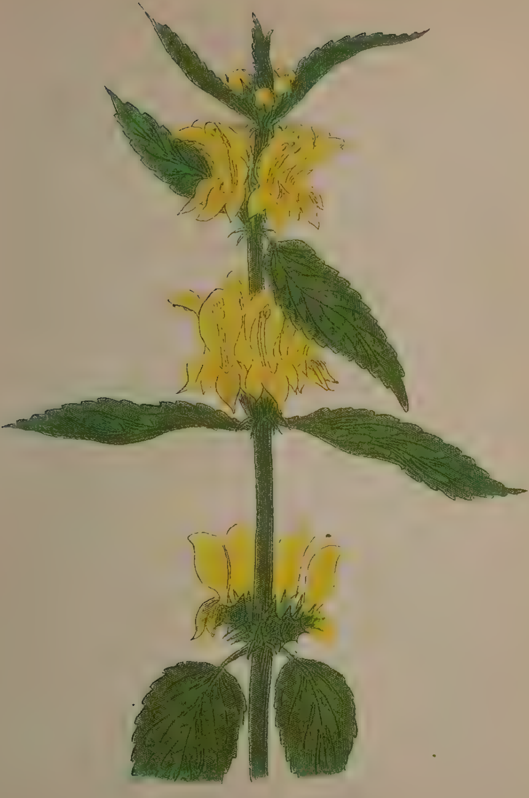
There are four other British species, but we describe one only here, the others being dealt with a few pages further on.

White Archangel or Dead Nettle (*L. album*) is much more nettle-like ; indeed, it is so like it before it is in flower that it cannot be distinguished at a casual glance. The square stem is about 2 feet high, hairy. The leaves are heart-shaped, toothed, and stalked. The flowers 1 inch long, pure white, from six to ten in a whorl ; corolla-tube curved, expanded at the mouth ; upper lip vaulted, hairy. It is chiefly in flower from May to December, but stray specimens may be found in sheltered places nearly all the year.

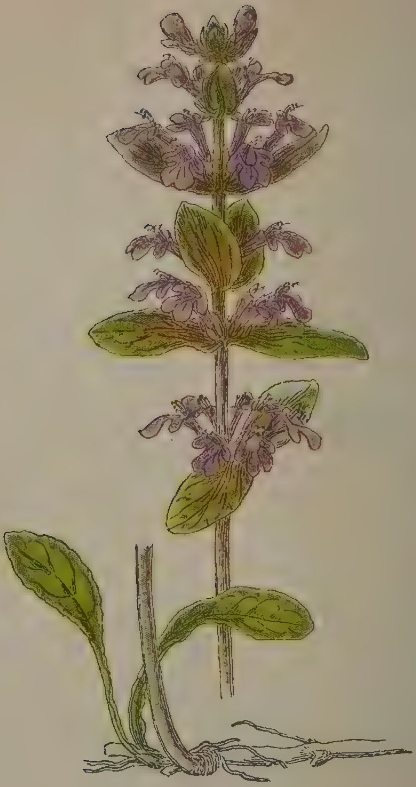
The remaining species will be found mentioned under Red Dead Nettle (page 114), with which they have closer affinity.

Bugle (*Ajuga reptans*).

The Common Bugle greets one from April to July in wood and field, and on the waste places by the roadside. It is a creeping plant, runners being sent out from the short stout rootstock, and these rooting send up flowering stems from 6 to 12 inches in height. The leaves from the root have long stalks ; those from the stem are stalkless. The flowers are blue, the upper bracts dull purple in colour, and the whorls come so close together that they form a terminal spike. The flowers are of the Labiate type like those of Archangel, but in this case the lips are not so long, though the lower is longer. The upper lip is two-lobed, the lower three-lobed. The upper



Yellow Archangel.
Lamium galeobdolon.
LABIATÆ.



Bugle.
Ajuga reptans.
Labiatæ.

2 *Pl.* 97

H III

usually acts as a roof to shelter the stamens and stigmas, the lower as a platform upon which insects may alight when they come to seek honey and to fertilize the flower. In the present species the anthers and stigmas project beyond the upper lip, which is very short; but they are protected by the overhanging lower bract of the flower above.

When the flower opens the two lobes (stigmas) of the style are already mature and fit for receiving pollen brought from an older flower, anthers not shedding their pollen until the stigmas have been fertilized.

There are two other native species:—

I. Pyramidal Bugle (*A. pyramidalis*), similar to the common species, but the whorls form a dense pyramidal spike, the calyx is woolly and the teeth longer; the lower lips of the corolla smaller, and its middle lobe less heart-shaped; the whole plant more softly hairy, and the radical leaves with shorter stalks. It is very rare, and restricted to the woods and streams of the mountains, not appearing south of Westmoreland.

II. Ground Pine (*A. chamæpitys*). An annual restricted to chalky fields and downs in the counties of Beds., Herts., Cambs., Essex, Kent, Surrey, and Hants. Entirely different in aspect from the other species. Stem about 6 inches, branched from the base, with long scattered hairs. The radical leaves lance-shaped, stalked, but these soon disappear. The stem-leaves are divided into three slender lobes. The small, yellow flowers are produced singly in the axils of the long leaf-like bracts; the lower lips spotted with red. May to September.

Hedge Woundwort (*Stachys sylvatica*).

Where the hedge is high and bosky, and the hedgebank runs up from a ditch, there, among the Brambles and Bedstraws and Stinging Nettles, you are almost sure to find the Hedge Woundwort. It is another of the Labiates. The leaves are large, heart-shaped, strong toothed, covered with soft bristles, the upper surface densely—their stalks often longer than the blade. The rough stem is *solid*, strong-smelling when bruised, much branched, 2 or 3 feet high. The flowers are in whorls around the upper part of the stem, six or more in a whorl. The calyx is nearly bell-shaped, with five triangular spiny teeth. The corolla is small, of a rich dark crimson or red-purple colour, the long lower lip marked with white. It flowers from June to August. The fruits are four nutlets, at first green and shining, then black and rough.

There are five other species :—

I. Marsh Woundwort (*S. palustris*), with stouter, *hollow* stem, less coarsely hairy, the leaves narrower, with shorter stalks or stalkless, odour not so obtrusive, and the flowers of a paler tint. Flowering from July to September, on river-banks and similarly wet places.

II. Downy Woundwort (*S. germanica*). A rare plant, affecting roadsides and fields where the soil is dry ; in Hants, Oxford, Kent, and Channel Islands. Covered with long, fine, white hairs. Stalks of stem-leaves short, those of radical leaves rather long. Leaves with rounded teeth. Corolla smaller than in *S. sylvatica*, downy, pale rose-purple, with lower lip spotted. Flowers July and August.

III. Corn Woundwort (*S. arvensis*). Branching from the base, slightly hairy. Whole plant small. Flowers pale pink, marked with white ; from April to November, in fields and wastes.

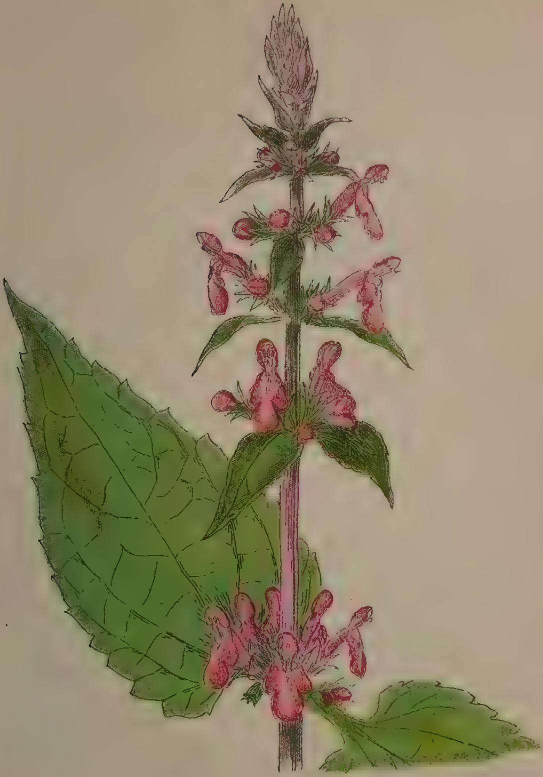
IV. Wood Betony (*S. betonica*). In all the preceding species the anther-cells diverge widely ; in this species they lie parallel. Leaves thick, oblong, heart-shaped ; those from the rootstock forming a tuft. Flowers large, corolla hairy, red-purple. Flowering June to August, in woody wastes.

V. Alpine Woundwort (*S. alpina*). Very similar to *S. sylvatica*. Stem 2 or 3 feet. Leaves oval, heart-shaped at base, with rounded teeth, downy on both sides, the lower ones with long stalks. Upper leaves lance-shaped, with shorter stalks. Flowers in whorls of five to ten. Calyx woolly without. Corolla purple, marked with white. Gloucestershire.

The name is Greek, *stachus*, a spike, in allusion to the inflorescence.

Lamb's-tongue Plantain (*Plantago media*).

The Plantains are among the despised of our wild-flowers, weeds among weeds. They are considered of interest only to the keeper of cage-birds, by whose pets the ripe fruit-stalks are much appreciated. But if we knew the plants better we should appreciate them more. There must be something worthy of respect in a plant that has contrived to get itself so taken throughout the world that it is known wherever Europeans have been, and is called by the coloured races the White-man's Foot. They are certainly out of place on a garden-lawn ; but the Lamb's tongue Plantain in flower on a bank is a thing of



Hedge Woundwort.
Stachys sylvatica.
Labiatæ.

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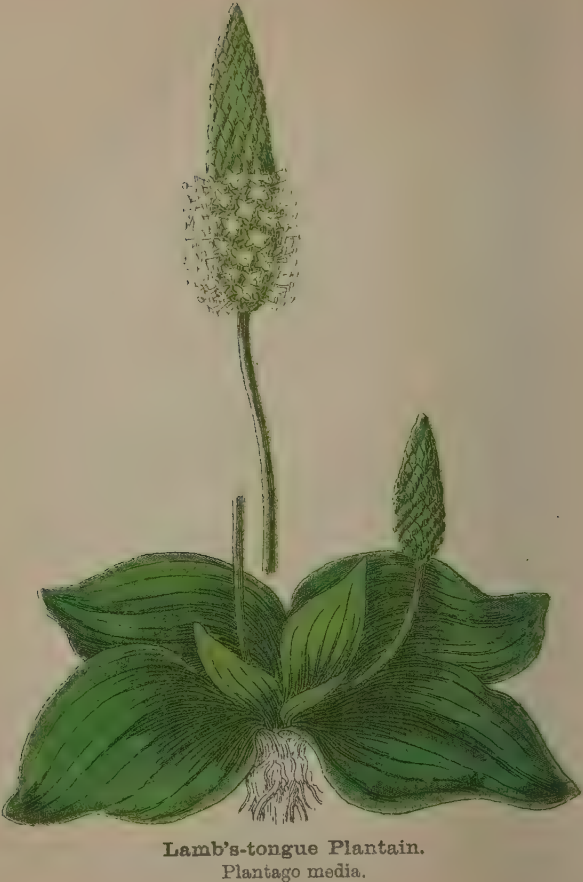


Lamb's-tongue Plantain.
Plantago media.
PLANTAGINACEÆ.

beauty. The leaves of the genus are characterized by having strongly developed parallel ribs on the under surface. There is no stem, the leaves all springing from the stout rootstock. The flowers are borne on tall spikes which spring from the axils of the leaves. Each blossom consists of four persistent sepals, a salver-shaped corolla with four lobes, between which are fixed the four stamens surrounding the long, simple, and hairy style. The stamens form the most conspicuous feature of the flower-spike. There are five British species. The name *Plantago* is the classic Latin one, from which the English has been evolved.

I. Lamb's-tongue Plantain (*P. media*): leaves elliptic, flower-scape 6 to 12 inches. Stamens long, anthers whitish. Seeds brown, rough. Pastures and waste places in a dry soil, June to October. Plant more or less covered with short hairs.

II. Greater Plantain (*P. major*) has very broad leaves and broad, short leaf-stalks. Stamens short, anthers purple. Seeds black and rough. Pastures and roadsides, May to September.

III. Ribwort Plantain (*P. lanceolata*): as the scientific name implies, the leaves are lance-shaped, long and narrow. The flower-scape is deeply furrowed, the flower-spike short. Stamens long, white. Seeds black, shining. Pastures and heaths, May to October.

IV. Seaside Plantain (*P. maritima*). Rootstock branched, crown woolly. Leaves narrower than the last, margins more parallel, ribs weak. Stamens pale yellow. Seeds brown, slightly winged at end. Pastures, salt-marshes and rocks by the sea, June to September.

V. Buck's-horn Plantain (*P. coronopus*). Leaves narrow, linear, divided, or deeply-toothed, suggesting the popular name; ribbed, hairy. Stamens pale yellow. Seeds pale brown. Poor gravelly soils, chiefly near the coast. June to August.

Red Dead Nettle (*Lamium purpureum*).

Our forefathers, when giving English names to plants, found it by no means easy work, and the greater number of our native species they left unnamed altogether. Many of the names they did invent were made to serve several times by the simple expedient of prefixing adjectives. Thus, having decided on Nettle as the distinctive name of certain stinging herbs (*Urtica*), they made it available for the entirely unrelated genus *Lamium* by calling the species Dead (or stingless) nettles. In a similar fashion they made Hemp Nettle and Hedge Nettle. Dead Nettle appears to have been originally Deaf Nettle—or in its Saxon form *Deffe-nettil*—signifying powerless. In some districts it is Dumb Nettle.

Apart from the resemblance in form of the leaves in certain species, there is little likeness between *Lamium* and *Urtica*, the large and graceful flowers of the former contrasting strongly with the inconspicuous green blossoms of the Stinging Nettles. In the absence of flowers the difference may be quickly seen by cutting the stems across, when *Urtica* will exhibit a round solid section, whilst *Lamium* is square and tubular. The flowers are like those of Archangel (page 109), and are produced in whorls. The calyx is tubular, with five teeth. The corolla tubular, with dilated *throat*, and two lips. The British species are five, of which two have already been described. The others are :—

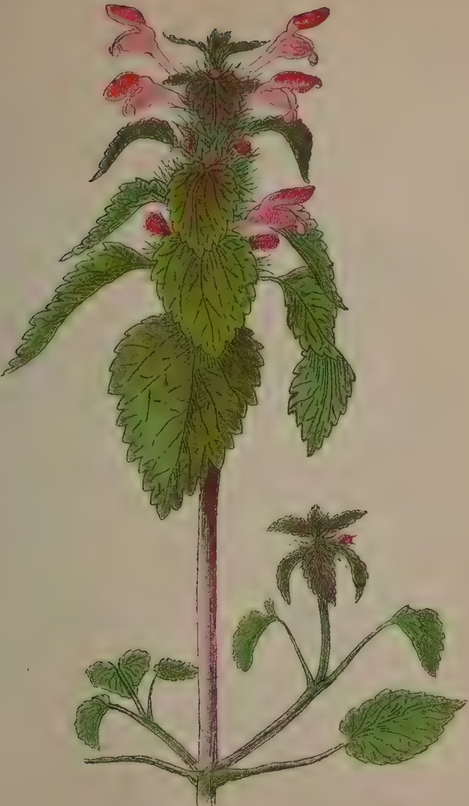
I. Red Dead Nettle (*Lamium purpureum*). Leaves heart-shaped, with rounded teeth, stalked. Bases of flower-bracts not overlapping. Corolla purplish-red. Whole plant often purple. Hedge-banks and waste places. April to October.

II. Intermediate Dead Nettle (*L. intermedium*). Intermediate between the first and the next species, but more robust. Bracts overlapping. Teeth much longer than calyx-tube, spreading. Cultivated ground, not in South of England. June to September.

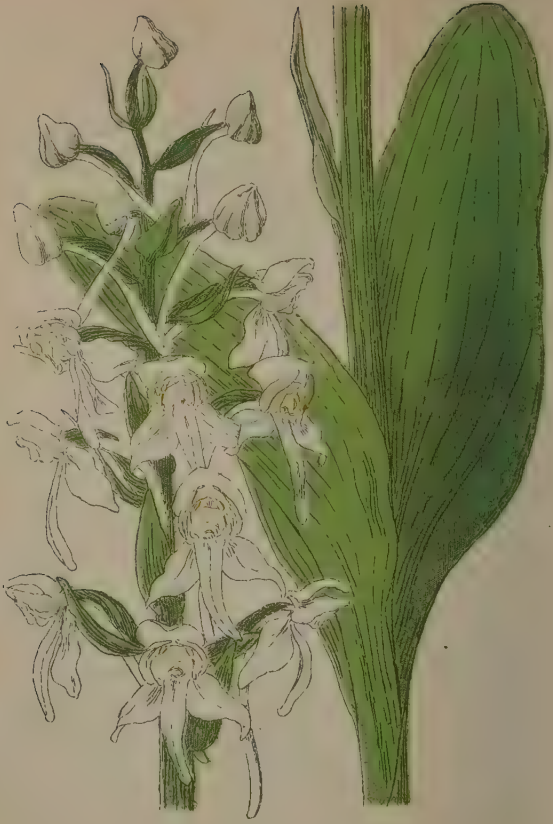
III. Henbit Dead Nettle (*L. amplexicaule*). Calyx more hairy than in I. and II. ; teeth equal to tube in length, converging when in fruit. Corolla slender, deep rose colour, often deformed. Bracts broad, overlapping. Waste places. April to August. Above three species are annuals, the remainder perennials.

Butterfly Orchis (*Habenaria bifolia*).

The Butterfly Orchis is the noblest of our native species of Orchids, and though it is not so well known as several other species, whoever has had the good fortune to see it growing is likely to remember it ; especially so if he came upon it in the evening, when its fragrance was beginning to be exhaled, and its white flowers showed up more strongly than they do in the daytime.



Red Dead-nettle.
Lamium purpureum.
LABIATÆ.



Great Butterfly Orchis.
Habenaria chloroleuca.
ORCHIDACEÆ.

2 *Pl* 101 *I* 115

The plant springs from a couple of lobed tubers, and has ordinarily only two large oblong leaves; occasionally there is a third leaf. There is a stout stem varying from 6 inches to a couple of feet in height, of which a half or a third is the flower spike, bearing the large (1 inch) white flowers, tinged with yellow or green. The petals, except the lips, are small, the coloured sepals large. The broad upper sepal, with the two upper petals, form a hood over the column; the lateral sepals become the butterfly's wings; and the long, narrow, undivided lip its body. There is a very long and slender spreading spur—twice the length of the ovary. It is found in rather elevated (up to 1500 feet) pastures, heaths, and woods, and flowers from June to August.

There is a sub-species known as the Great Butterfly Orchis (*H. chloroleuca*) with larger flowers, lateral sepals broader and the spur stouter, with a more club-shaped extremity, and more curved. Flowering May till July.

There are four other species in the genus, which is named from the Latin, *habena*, a thong or strap, in reference to the lip of some species:—

I. Fragrant Orchis (*H. conopsea*) presents no superficial likeness to the Butterfly Orchis, having a dense cylindrical spike of small, bright, rosy-purple fragrant flowers, which are broader than long. The broad lip is divided into three nearly equal rounded lobes, and the very slender spur is twice the length of the ovary, and twice curved. Dry pastures; June to August.

II. Entire Habenaria (*H. intacta*) is a rare species, restricted to limestone pastures in Mayo and Galway, with oblong leaves, often spotted, and a dense spike of small pink or purplish flowers in June. Spur almost globular.

III. Small White Habenaria (*H. albida*). A local species found in hilly pastures north of Yorkshire and Lancashire, also in Wales and Sussex. It has fleshy fibres instead of tubers, and the flowers are small ($\frac{1}{6}$ inch), as in the last species, but white, with the projecting lip divided into three triangular lobes, and the sepals forming a hood; spur short. Flowers sweet-scented; June to August.

IV. Frog Orchis (*H. viridis*). Tubers lobed; leaves narrow-oblong. Flowers green, striped with dark red ($\frac{1}{2}$ inch) in a loose spike; June to August. Sepals forming a broad hood, lip strap-shaped, two-lobed. Hilly meadows, generally distributed except Cornwall.

Bee Orchis (*Ophrys apifera*).

In the genus *Ophrys* we have three species whose flowers bear quite startling likeness to a bee, spider, and fly respectively. What is the purpose of this counterfeit presentment it is difficult to conjecture. It has been suggested that it might be to warn off or deceive insects, as the flowers are self-fertilized, but Charles Darwin did not think this was the probable reason. There is no spur in this group, there is no rostellum, and the ovary is not twisted. The stalks (*caudicles*) of the pollinia are so long and thin that the weight of the pollen-masses causes them to bend over and touch against the stigma, fertilizing it.

I. Bee Orchis (*O. apifera*). The lip is very convex and broad, three-lobed, of a rich velvety-brown colour, spotted with yellow, and with a recurved point which mimics the sting of the bee. The sepals are pinkish. The spike has only about half a dozen flowers upon it, with a large leafy bract under each, and only two or three of these are open at one time. Hillsides, fields and copses on chalk and limestone, chiefly in the South of England and Ireland. June and July. Occasionally the flowers are white, and sometimes the lip is concave instead of convex. There is a sub-species known as the Late Spider Orchis (*O. arachnites*), with the lip longer than the sepals, and with the appendage straight or incurved, and green. Pollinia stiffer and not falling forward upon the stigma. Kent and Surrey only.

II. Spider Orchis (*O. sphegodes*). Similar to the last, but the sepals greenish, labellum differently marked, and without a tail. Similar situations to *apifera*, but much more rare. April and May.

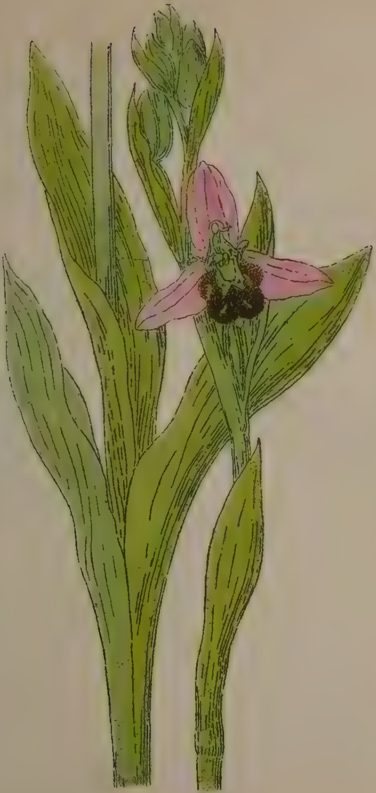
III. Fly Orchis (*O. insectifera*). Sepals greenish, labellum narrow, flat, brown, with a yellow-edged, squarish blue patch. Strikingly like a fly. May to July.

The name of the genus is from the Greek, *ophrus*, an eyebrow, said to refer to the markings on the lip.

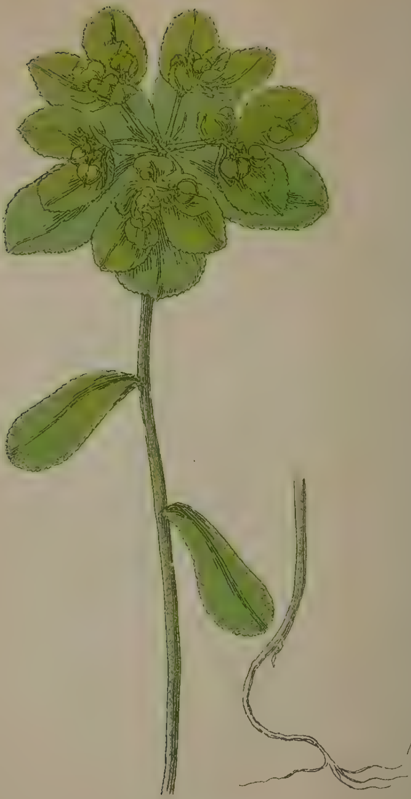
Several other British species in different genera from those named bear similarly strange likenesses, such as the extremely rare Lizard Orchis (*Orchis hircina*), but some of the foreign forms are more remarkable in this respect.

The Spurge Family (*Euphorbia*).

The whole of the British species of Spurge have a singular character, which enables the tyro in botanical matters to determine the genus at a glance, though he may not be so successful



Bee Orchis.
Ophrys apifera.
ORCHIDACEÆ.



Sun Spurge.
Euphorbia helioscopia.
Euphorbiaceæ.

in distinguishing between the twelve or thirteen native species. This singularity is chiefly due to the colour and arrangement of their flowers. These possess neither sepals nor petals; instead, a number of unisexual flowers are wrapped in an *involucre*. An individual involucre of, say, the Sun Spurge, should be detached and examined with the aid of the pocket-lens. It will be seen to have four lobes, to each of which is attached an orbicular yellow gland. Within the involucre are several flowers, each consisting of a single stamen on a separate jointed flower-stalk, and from the midst of these arises a single pistillate flower on a long, curved stalk. With slight variations this is the form of inflorescence which characterizes the whole genus. The British species may be briefly enumerated thus :—

I. Sun Spurge (*E. helioscopia*) Annual herb with yellow-green oval leaves, the margin of upper half toothed. Milky juice used as a wart-cure. Waste places, June to October. (Plate 103.)

II. Broad-leaved Spurge (*E. platyphyllos*). Annual. Leaves broad, lance-shaped, sharp-pointed, toothed above middle. Fruit (capsule) warted. Fields and waste places from York southwards; rare. July to October.

III. Irish Spurge (*E. hiberna*). Perennial. Leaves thin, oval, not toothed, tip blunt or notched; upper leaves heart-shaped. Glands of involucre purple, kidney-shaped. Hedges and thickets, rare; only in North Devon and South and West of Ireland. Flowers May and June. Juice used by salmon-poachers for poisoning rivers.

IV. Wood Spurge (*E. amygdaloides*). Perennial, stout, red, shrubby. Leaves oval, thick, tough, reddish, 2 to 3 inches long, hairy beneath, lower on short stalks. Involucral glands half-moon shaped, yellow. Woods and copses, chiefly on clay soils. Flowers March to May.

V. Petty Spurge (*E. peplus*). Annual. Leaves thin, broadly oval, on short stalks, ¾ inch long. Involucral glands half-moon shaped (*lunate*), with long horns. Waste ground, market-gardens and flower-beds. July to November.

VI. Dwarf Spurge (*E. exigua*). Annual. Much branched. Leaves very narrow and stiff. Involucres small, almost stalkless. Involucral glands, rounded with two blunt-pointed horns. Fields, especially on light soil. July to October.

VII. Portland Spurge (*E. portlandica*). Perennial, tufted, many-branched stems. Leaves tough, oval pointed, spreading. Involucral glands, lunate, with two long horns. Sandy shores, on South and West coasts, and in Ireland. May to August. Rare.

VIII. Sea Spurge (*E. paralias*). Perennial, bushy, many-stemmed, stout, reddish, woody below. Leaves narrow, concave, very thick, arranged in whorls. Points of involucral glands short. Sandy shores. July to October.

IX. Leafy-branched Spurge (*E. esula*). Perennial. Rootstock creeping. Stem slender. Leaves thin, narrow, sometimes toothed. Involucres small, on long stalks, glands lunate, with short straight horns. Woods and fields; Jersey, Forfar, Edinburgh, and Alnwick. July.

X. Cypress Spurge (*E. cyparissias*). Perennial. Rootstock creeping. Leaves *very narrow*, not toothed. Woods, England. June and July.

XI. Caper Spurge (*E. lathyrus*). Biennial. Stem short and stout, 3 to 4 feet second year. Leaves narrow, broader at base, opposite, alternate pairs placed at right angles to each other (*decussate*). Copses and woods, June and July. Fruit used as a condiment.

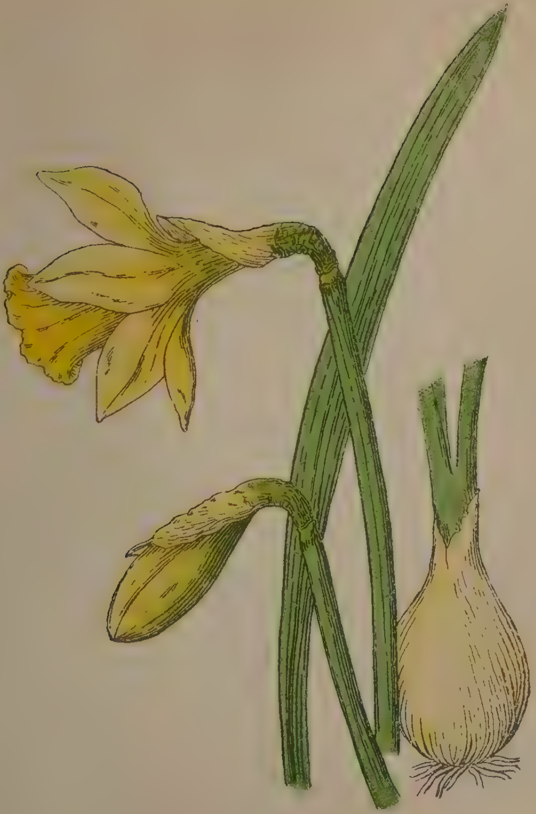
XII. Purple Spurge (*E. peplis*). Annual. Stems prostrate, purple, glaucous. Leaves oblong, heart-shaped, thick, on short stalks, with stipules, opposite. Glands oblong. Very rare. On sandy coasts, South Wales, Cornwall to Hants, and Waterford. July to September.

All the species have milky sap. Poisonous. The name is the same as that used by the ancient Greeks.

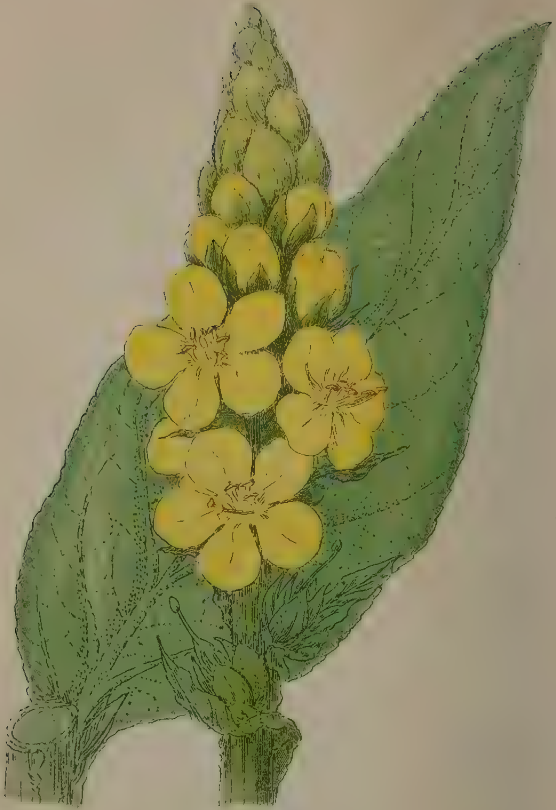
Daffodil (*Narcissus pseudo-narcissus*).

The Daffodil as a wild plant in England is extremely local, but where it occurs it is usually in great profusion. In Scotland and Ireland it may also be found, but not truly wild; it is only naturalized. With the Snowdrop and Snowflakes, described further on, it completes the representation in this country of the elsewhere important Order Amaryllidaceæ. All the plants of the Order are characterized by having the rootstock in the form of a bulb, the somewhat flattened flower-scape leafless, though the flowers are first enveloped in a dry skin-like spathe, or bract. The flower consists of a perianth of six coloured floral leaves, without distinction between sepals and petals, and attached above the ovary.

The few linear leaves of the Daffodil spring directly from the rootstock; they are nearly flat, and of a glaucous, blue-green hue. They greatly enlarge after flowering. Only one flower appears on the scape, of which the perianth segments are clear pale yellow, but from the centre is produced a long tubular crown of a golden hue, with an uneven toothed margin. Within this tube are the six stamens, and the long style with its three-lobed stigma.



Daffodil.
Narcissus pseudo-narcissus.
AMARYLLIDACEÆ.



Great Mullein.
Verbascum thapsus.
SCROPHULARIACEÆ.

There are several well-defined departures from the typical form that may be found in certain localities; but though these have received varietal names, they are believed not to have originated in this country, but to have been introduced on account of their variation, and escaped from cultivation. One of these (var. *lobularis*) has both perianth and crown of the same full golden yellow, and the crown distinctly divided into six lobes. Then there is the more robust var. *major*, in which, as the name suggests, the flowers are much larger, the perianth segments broader, and the flower of one uniform richer yellow. In South Cornwall, this large-flowered form is plentiful, and, apparently wild, growing on the slopes and summits of high hedges, and producing its flowers in February. *N. pseudo-narcissus* flowers ordinarily in March and April. The name of the genus is a mythological one applied by the Greeks to the *Narcissus poeticus.*

Great Mullein (*Verbascum thapsus*).

This is the Common Mullein, the Hig-taper of our Saxon forefathers. The latter name is one that has been much and variously explained. It has been spelled *high* and *hag;* high, it has been said, because dipped in melted grease, and used as a torch or taper at high festivals of the mediæval church; hag because the witches were fond of it. The truth is, hig is only a corrupt spelling of the Saxon *hæg*, hedge, and taper is a very appropriate name for the tall plant with its flame-like spike of golden flowers. All five British species of Mullein are usually biennials, with leaves more or less woolly. In the Great or Common species, which is also called Torch-blade, the leaves are exceedingly shaggy. Those from the root are very large, broadly lance-shaped, more than a foot long, but as we look up the stem we see each higher leaf smaller than the one next below it. The stem-leaves have their edges continued for some distance down the stem, and are therefore *decurrent*. During the first year of the plant's life it has no ascending stems ; this comes not until the Mullein is preparing to flower in the second year, when it runs up to 4 or 5 feet in height, and finishes in the flower-spike. The flowers are five-parted, the corolla wheel-shaped, with five nearly equal lobes, 1 inch across, and woolly outside. It is the rule among plants of the Order Scrophulariaceæ (with which we now make acquaintance), that though the calyx and corolla are five-parted, there are only four stamens ; but the genus *Verbascum* is exceptional, in so far as its members have five stamens. In the common species the two long stamens have smooth filaments, but the filaments of the shorter ones are bearded with white hairs. Flowers from June to August in dry wastes. The other species are :—

I. White Mullein (*V. lychnitis*). With angled stem, 3 feet. Radical leaves, stalked, lance-shaped, white beneath only. Flowers small, whitish, in narrow racemes. July and August.

II. Hoary Mullein (*V. pulverulentum*). Mealy, with round stem and velvety leaves. Similar in habit to *lychnitis*, but radical leaves broader, stalkless ; stem leaves heart-shaped. Flowers bright yellow. July. Norfolk and Suffolk only.

III. Dark Mullein (*V. nigrum*). Perennial. Stem angled, 2 to 3 feet. Whole plant covered with long, woolly hairs, but not so matted as in last species. Radical leaves, stalked. Flowers yellow, stalked, in racemes. Hairs of anther-filaments purple. June to October.

IV. Moth Mullein (*V. blattaria*). Nearly smooth. Stem slightly angled, slender, 1 to 4 feet. Flowers bright yellow, sometimes cream-coloured, filament hairs purple. Rare. June to October.

Name altered from the Latin, *barbascum*, from *barba*, a beard.

Flowering Rush (*Butomus umbellatus*).

By ditches and the backwaters of rivers in June and July we may come upon a beautiful plant which, once seen, will never be forgotten. Its tall flower-stem, 5 or 6 feet in height, crowned with its spreading umbel of large rosy flowers, is a very striking object, and is certain to beget the desire of possession ; though this is not always easy of accomplishment, for *Butomus* loves to grow at sufficient distance from firm land to make wading a necessity for its acquisition. The base of this noble plant is a stout creeping rootstock, from which all the leaves arise—there are none on the stem. These leaves are 3 or 4 feet long, of a slender three-sided form, of cellular structure, and sheathing one over the other at the base. Before the flowering period the plant may easily be overlooked as one of the rushlike plants among which it grows. The flowering-stem is round, and the umbel starts from an involucre of three thin papery bracts. The footstalks of these flowers are from 2 to 4 inches long, the flowers 1 inch across, made up of a six-leaved perianth, in two series of three, but all coloured and spreading. There are nine stamens, and six very prominent carpels with short styles ; both carpels and anthers are coloured like the perianth. This is the only species of the genus, whose name is said to be derived from the Greek words *bous*, an ox, and *tomos*, cutting, from a notion that their leaves sometimes cut the oxen that water in the places where the Flowering Rush grows. Like the Water Plantain and the Arrowhead, it is included in the order Alismaceæ, and having said this it is unnecessary to add that the plant is a rush only by the courtesy of the unscientific public.

Hare's-tail Grass (*Lagurus ovatus*).

Although the Hare's-tail Grass is restricted as a native to one of these islands, it is so strikingly different in aspect from all our other species that we could not resist the temptation of including its portrait. It is an annual grass with broad, short, flat leaves, and several downy stems, 6 to 10 inches long, ending in a dense, hairy, egg-shaped head of white spikelets, 1½ inch long and half as broad. Each spikelet consists of two large empty glumes, and a smaller flowering glume. The empty glumes end in slender feathery points ; the flowering glume has two short awns, and between them a much longer, bent, and twisted one. There are three stamens. It is in flower in June, and grows as a native in sandy places in Guernsey, but also occurs near Saffron Walden, where it has become naturalized.

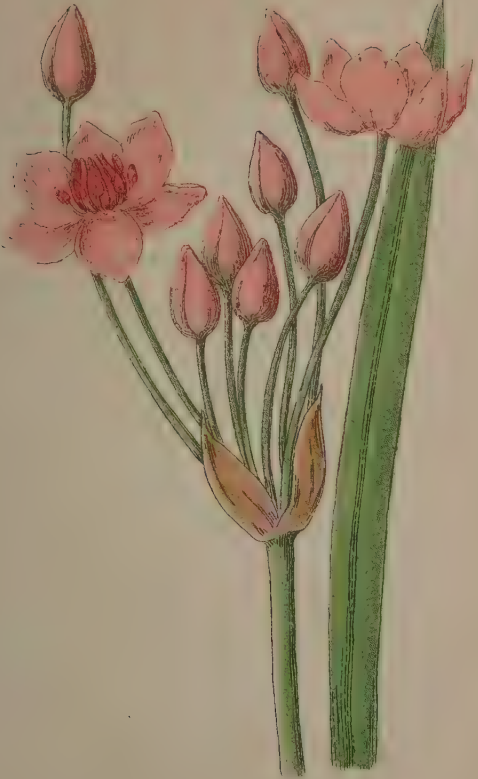
It is the only species of the genus, whose name is derived from the Greek *lagos*, a hare, and *oura*, a tail.

Dog's Mercury (*Mercurialis perennis*).

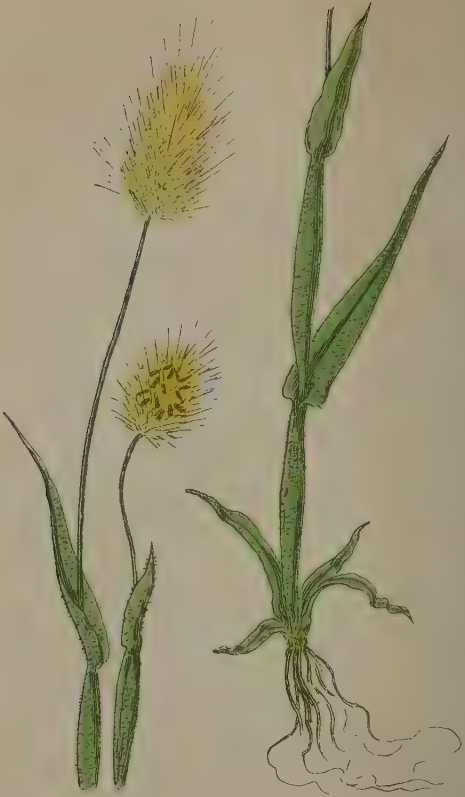
The Mercuries are nearly allied to the Spurges, and share their poisonous qualities. That cattle are aware of this obnoxious character may frequently be seen by some shady copse-side or roadside where Dog's Mercury (*Mercurialis perennis*) is abundant, and cattle are turned out to graze. All the wholesome herbage will be closely cropped all round, but the dark green clump of Mercury will be left untouched. The Annual Mercury (*M. annua*) does not appear to be poisonous in the same degree, for its leaves are used as a pot-herb.

Both species are erect growing, with stems from 1 foot to 1½ feet in height, and with opposite, stalked and toothed, oval or lance-shaped leaves. In each species the male flowers are distinct from the females ; stamens and pistil are not borne by the same flower. The flowers are minute, green, consisting of three sepals, no petals, the female with a two-celled ovary, two simple styles, and two or three stamen-filaments, but no anthers. The male flowers contain from eight to twenty erect stamens on a central disc, with slender filaments and pendulous anthers, but no trace of an ovary.

Dog's Mercury (*M. perennis*) is one of the common weeds of the woodland and wayside that only those genuinely interested in botany trouble to inquire about. It has a perennial, creeping rootstock, an unbranched stem, and is tolerably hairy. Male flowers in slender racemes on a long stalk ; female flowers in a shorter spike, with only two or three flowers. This is a



Flowering Rush.
Butomus umbellatus.
ALISMACEÆ.



Hare's-tail Grass.
Lagurus ovatus.
GRAMINEÆ.

spring bloomer, the flowers appearing from March to May, and the plant forming extensive communities in woods.

Annual Mercury (*M. annua*) is almost free from hairiness, with opposite branches, and leaves of very thin texture (*membranous*), smooth and shining, the edges fringed with hairs. The female clusters of flowers sometimes contain a few males, but as a rule the two kinds are borne by different plants (*diœcious*). The male flowers are in loose spikes. Flowers July to October, around fields near towns and villages. It is not common anywhere ; in Scotland and Ireland rare.

The name is classical, the god Mercury being supposed to have discovered some medicinal virtues in these plants.

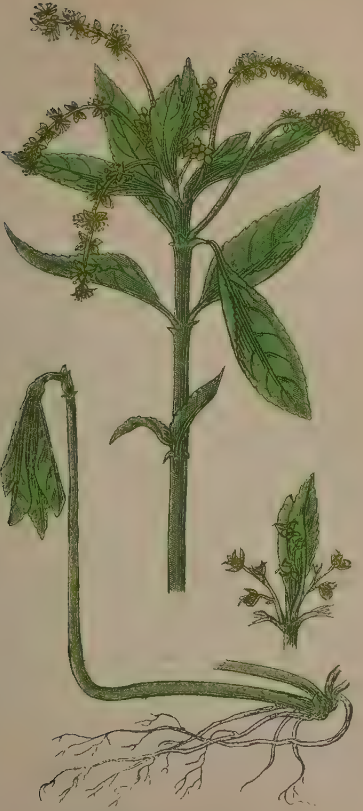
Frogbit (*Hydrocharis morsus-ranæ*).

This pretty aquatic plant must be sought in the still waters of ditches and river backwaters, where its white and yellow petals are probably mistaken for those of the much more plentiful Crowfoot, and passed by. But, as a rule, the time of the Crowfoot's flowering has passed when the Frogbit commences her display. From the tufted appearance of the plant, as faithfully portrayed in our figure, it might be supposed that its base would be embedded in the mud of the bottom, but that is not so. The plant, as figured, floats upon the surface, and sends out long horizontal runners, from whose joints tufts of very long roots descend, and penetrate deeply into the mud. On certain of these roots little bulbs are produced, from which new plants arise. The leaves are 1½ inch across, roundish-kidney-shaped, on long stalks ; the undersides more or less reddish. The flowers, which are 1 inch across, consist of three small oblong sepals, and three large white crumpled petals. The stamens and pistil are in different flowers ; the stamens are twelve in number, of which, however, three or six bear no anthers. There are three imperfect styles in this male flower. The female flowers have a fleshy gland at the base of the petals, and six imperfect stamens round the egg-shaped ovary. There are six styles (agreeing with the six cells of the ovary), united at their base. The flowers are at first enveloped in a semi-transparent spathe ; the male flowers (two or three) in a stalked two-leaved spathe ; the female solitary in a one-leaved stalkless spathe. It flowers in July and August. This is the only species. It does not occur north of Durham, nor in Cornwall, and only locally in Ireland.

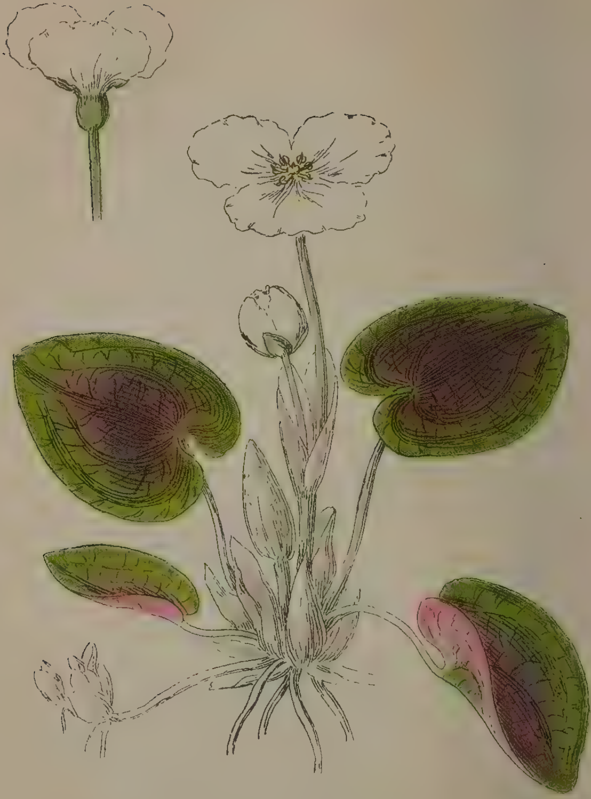
The name is from two Greek words, *udor*, water, and *charis*, beauty or delight = the delight of the waters.

Branched Bur-reed (*Sparganium ramosum*).

On the margin of a big pond or small lake, hidden maybe among the woods, the botanist finds abundant material for study. So many species of different orders and genera are there, that, if he is just starting a herbarium, he will probably take away more specimens than he can properly attend to at once. Among these will probably be one or other of our three species of Bur-reed, most likely the one we have chosen for illustration, as it is the most widely distributed. They are perennial plants, with creeping rootstocks, and long, narrow, bayonet-shaped leaves with blunt tips. *S. ramosum* has a branching, erect stem, as much as 4 feet high, with leaves sometimes 5 feet long, three-sided at the base, and 1 inch across. There are long narrow bracts on the stem, and from their axils rise the flowering branches. The flowers form globose heads, of which it will be seen there are two sorts, the upper, smaller, and olive-coloured ones being the male flowers, whilst the lower and larger are the female heads. Individually, the flowers composing these heads consist of a perianth of three or six thin, spoon-shaped scales. In the male flowers there are two or three stamens, and in each flower of the female-head there is a one- or two-celled ovary, which develops into a



Dog's Mercury.
Mercurialis perennis.
EUPHORBIACEÆ.



Frog-bit.
Hydrocharis morsus-ranæ.
HYDROCHARIDACEÆ.

pear-shaped *drupe*—that is, a fruit like a cherry, fleshy without, and hard within. The flowers will be found in June and July, and the plant affects the banks of ponds, ditches, and streams. The other species are:—

I. Unbranched Bur-reed (*S. simplex*). Stem erect, 2 feet, unbranched. Flower-heads in a raceme; male pale yellow, stalkless; female on footstalks. Drupes stalked, narrow at each end. June and July.

II. Floating Bur-reed (*S. natans*). Stem limp, leafy, upper part floating, partially erecting itself when in flower. Leaves floating. Flowers similar to *simplex*, of which this plant may be a sub-species. July and August.

The name is from the Greek, *sparganon*, a swathing-band, in allusion to the shape of the leaves.

Knotted Figwort (*Scrophularia nodosa*).

It is a singular thing that, though most of the genera in the Natural Order Scrophulariaceæ contain species with honeyed flowers, and most of them are carefully designed that insects may be the agents in cross-fertilization, none of the flowers give forth pleasant odours. If they are odorous at all, it is with anything but a fragrant scent. But they have their customers among insects, and provide that for which there is a demand. This Knotted Figwort (*Scrophularia nodosa*), for example, gives out a flavour that is nauseous to the human sense of smell, but to the flies and wasps by which it is fertilized, it is, no doubt, suggestive of carrion.

The Knotted Figwort has a knotted tuberous rootstock, a four-angled stem, with opposite, pointed, egg-shaped leaves, 2 to 4 inches long, stalked, their edges sharply toothed, and the teeth themselves edged with secondary teeth. The stem varies from 1 to 3 feet in height, and is unbranched. The flowers are arranged in cymes, and consist of a five-parted calyx, a corolla-tube swollen at the lower part, the mouth cut into five unequal lobes, of which the upper two are the largest, and the lowest and odd one spreads outwards. The colour of the corolla is either green or brownish. The plant may be found in flower from July to October, in shady places. The stigmas are ripe before the anthers, a condition entirely the opposite of many plants we have described, but the object is the same in each case. Flies that have already visited an older flower bring with them pollen from its ripe anthers, and, by dropping a little on the stigmas of this younger blossom, secure cross-fertilization before its own pollen is discharged.

There are two other British species :—

I. Water Figwort (*S. aquatica*), found by the edges of ponds, streams, and ditches, with creeping rootstock, and a stem rising to 3 or 4 feet (we have measured specimens in Cornwall 10 feet high), square, with wing-like expansions at the angles. Flowers green on the lower surface, brown on the upper side, but occasionally all white. July to September.

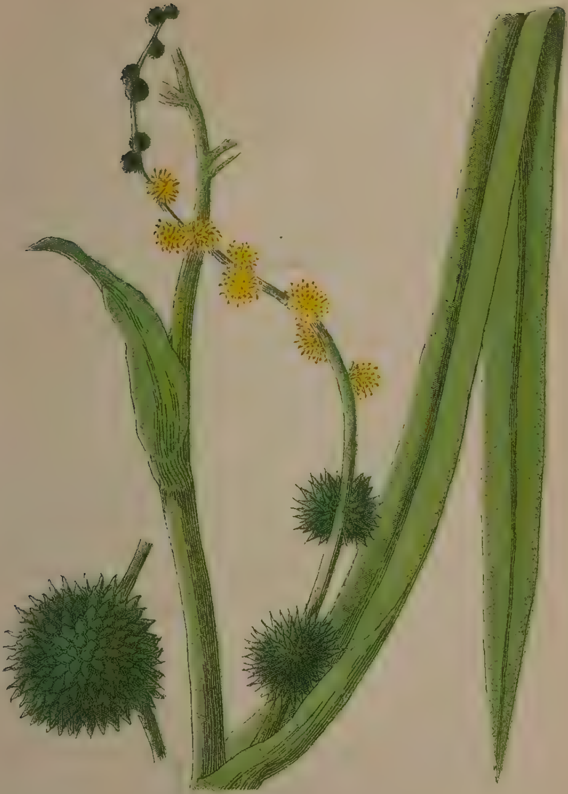
II. Balm-leaved Figwort (*S. scorodonia*). Rootstock creeping, stem not so evidently square as the others; 2 to 4 feet. Leaves heart-shaped, wrinkled and downy, with rounded teeth. Corolla dull purple. July and August, in Cornwall, South Devon, and Kerry.

Another species, not British, is occasionally found, the Yellow Figwort (*S. vernalis*), with small, yellow blossoms, flowering from April to June in waste places, but very local.

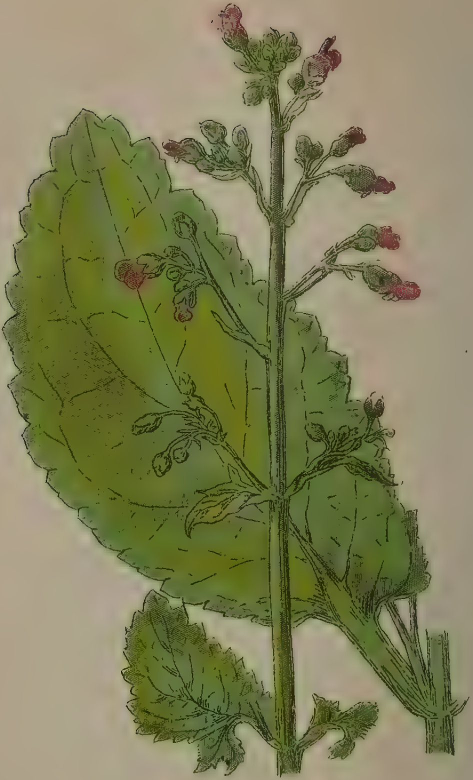
The name is from *scrofula*, for which it was formerly considered an excellent remedy.

White Helleborine (*Cephalanthera grandiflora*).

The White Helleborine must be described as rare, but not so rare that a flower-lover need despair of finding it, if his rambles take him through a wood on the slope of a chalk down in May or June. Such a place is in our mental vision now, a long-stretching chalk-flank, well covered with pine and beech, with the great golden St. John's Wort beneath them, and hundreds of big Roman snails in the evening. There, on the grassy banks, one can always find this beautiful orchid growing. It is not tuberous-rooted, but has a creeping rootstock, from which rises a tuft of leafy stems, as much as 2 feet in height. These leaves are long and broad, the lower ones sometimes as much as 6 inches in length; the upper ones becoming bracts, in



Branched Bur-reed.
Sparganium ramosum.
TYPHACEÆ.



Knotted Figwort.
Scrophularia nodosa.
SCROPHULARIACEÆ.

whose axils the creamy white flowers are produced. All the petals and sepals have their margins curved inward, except the lip, which curves outwards, and is continued backwards into a hollow. This lip is formed of a basal portion and a triangular flap, which closes the entrance to the flower at first, then folds down to form a platform in front of a triangular opening, afterwards rising up and closing the aperture again. These movements refer to the fertilization of the flower by insects. There is no rostellum in this genus, and the pollen-masses are situated just above the stigmatic surface, whence they are dislodged by a visiting bee and carried off to fertilize another flower.

There are two other British species :—

I. Narrow-leaved Helleborine (*C. longifolia*). Leaves slender, longer than in *grandiflora* ; upper bracts minute. Flowers whiter, narrower. Similar situations and seasons, but more local.

II. Red Helleborine (*C. rubra*). Very rare. Confined to limestone woods in Somerset and Gloucester. June and July. Lip white, remainder of flower rose-purple.

The name is from two Greek words, *kephale*, a head, and *anthera*—the anther forming a head to the narrowed neck-like column.

Snake's-head, or Fritillary (*Fritillaria meleagris*).

A plant of the Liliaceous tribe, without distinction between petals and sepals. It is a plant of wet meadows and pastures, that must be described as rare, for its range is limited, though in some of the places where it is found it is fairly abundant. The bulb is small, composed of only two or three thick fleshy scales ; the leaves are very narrow (not more than $\frac{1}{3}$ of an inch), but 6 or 8 inches in length. The flower-stem is from 1 foot to $1\frac{1}{2}$ feet long, leafy, with a solitary flower, or occasionally two flowers. These flowers, which appear in May, are much like a tulip in shape, but drooping. The six floral leaves are purple flecked with oval patches of a paler tint ; there is a honey gland at the base of each. The unexpanded flower is supposed to resemble the head of a snake ; hence one of the popular names.

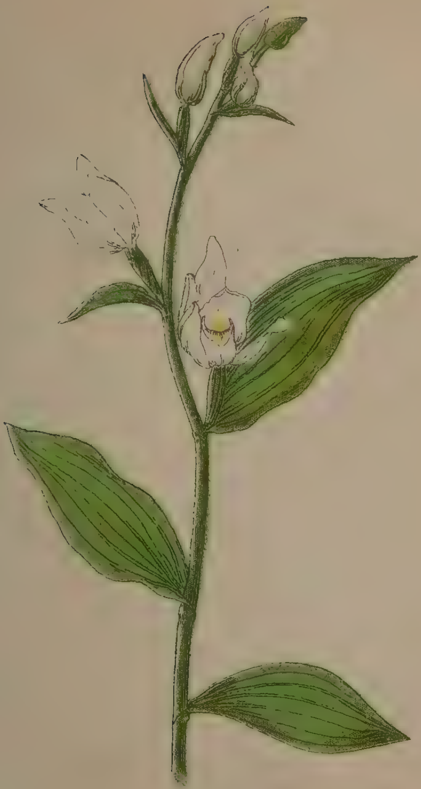
The six stamens have yellow anthers. There is a variety with white flowers.

This is the only species occurring in this country, and by some it is considered to be not really indigenous. Its range is from Norfolk and Stafford to Somerset and Hants. The name is from the Latin, *fritillus*, a dice-box, though the allusion is really to the chequered board upon which the dice were thrown. Some of the artists, biassed by this name, have painfully squared all the colour patches in their drawings.

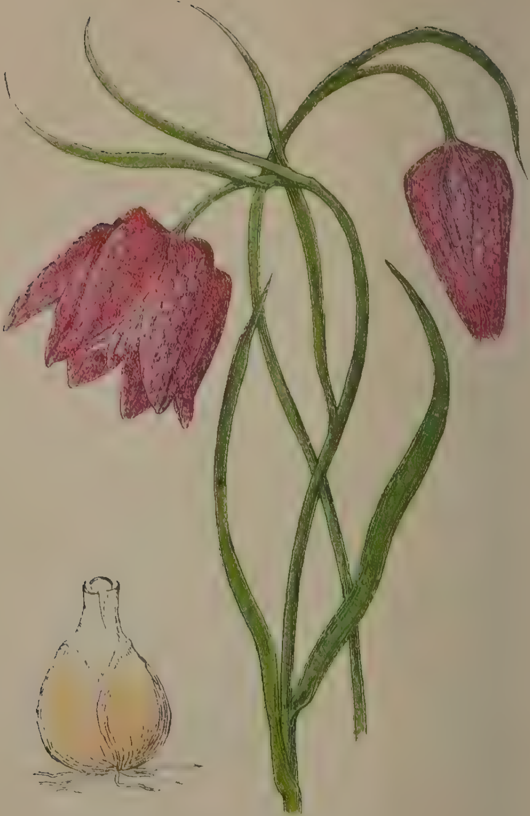
Snowdrop (*Galanthus nivalis*).

It is generally agreed among botanists that the Snowdrop is not indigenous to this country, although it is now found thoroughly naturalized and quite wild in orchards, copses, and meadows, at intervals throughout the country. There is a suspicion, based on the conditions of its growth, that in Denbigh and Hereford it may be native. In some cases it is the sole memorial of the cottage that once stood within the wood or orchard, in whose garden a little clump of snowdrops was planted many long years ago. The walls of the cottage have fallen and been levelled, the people who lived in it forgotten, save by one or two of the oldest folk. All the other garden plants have been killed out by the native weeds, but the Snowdrop alone has held her ground and spread over the whole enclosure, so that the people of the village often come, with trowel in hand, and remove a clump of the bulbs to their cottage gardens. May it spread still more in our land! We are never likely to regard it as a nuisance, as foreign plants taking too kindly to an adopted land are apt to become.

The Snowdrop belongs to the (in this country) little order of Amaryllids, having for company the Daffodil and the Snowflake. Its stem takes the form of a little brown bulb, "in size no bigger than a hazel-nut," and from this appears, in the very



White Helleborine.
Cephalanthera grandiflora.
ORCHIDACEÆ.



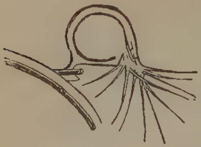
Snake's-head.
Fritillaria meleagris.
LILIACEÆ.

earliest days of the year, often when the ground is covered with snow, a solitary pair of long, straight-sided (*linear*), narrow leaves, of glaucous or sea-green hue, and slightly keeled on the outer surface. A little later there comes up direct from the bulb an unbranched flower-stem (*scape*), bearing a large bract, or spathe, from which issues the solitary flower on a thin bending stalk. The three spreading sepals are pure white, and the three smaller petals are also white, but with a patch of green near the notched upper edge of each, and several green lines on the inner surfaces. There are six stamens, and a slender style. The flower is honeyed and scented, and remains open from about ten till four. The ovary is inferior. The flowering period is from January to March. The name of the genus is a compound of two Greek words, *gala*, milk, and *anthos*, flower = the milk-white flower. *Nivalis* is the Latin for snowy.

The Snowflakes, though constituting a separate genus (*Leucojum*), are very closely allied to *Galanthus*. There is, however, no distinction in form or size between petals and sepals, as in the Snowdrop; nor in colour, for each is pure white, with a small green patch near the tip. The flowers, too, instead of being solitary, are produced from the spathe in a cluster of from two to six. The leaves of *L. æstivum*, the Summer Snowflake, appear in the winter, but the flowers not till May; both flowers and leaves of the smaller *L. vernum*, or Spring Snowflake, appear about March. The latter species bears only one or two flowers. *L. vernum* has only been found in copses in Dorset, but *L. æstivum* is a plant of osier holts and wet meadows between Suffolk, Oxford, Kent, and Dorset. The name is Greek, signifying white-violet, from the words *leukos* and *ion*.

Greater Bladderwort (*Utricularia vulgaris*).

The Bladderworts and the Butterworts together constitute the sole British representatives of the small Order Lentibulariaceæ. The Butterworts, as we have seen, are insectivorous plants of boggy ground; the Bladderworts have the same predaceous propensity, but they are aquatics. They are not attached to the bottom of the pools and ditches where they are



Bladderwort's trap.

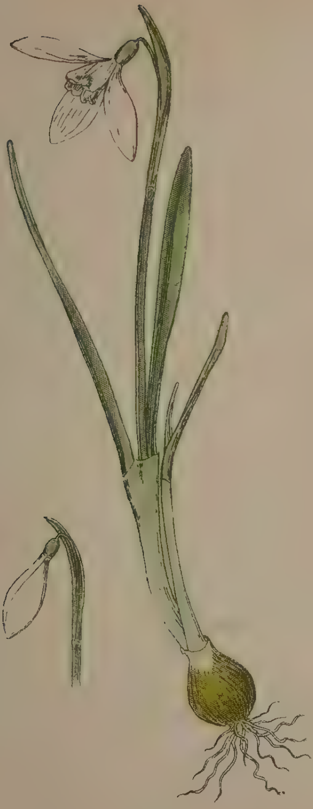
found, but float in the water. Their leaves are reduced to fine green branched hairs, which look like the fronds of Confervæ, and a careful examination is required to determine how many of them belong to one, or where the thread-like stem ends and the leaf begins. Upon the segments of the broad oval leaf there are little pitchers or bladders—in *U. vulgaris* varying from $\frac{1}{8}$ to $\frac{1}{4}$ inch across—of which a diagram is here given. These bladders open by an elastic door-like valve, which allows the entrance of a water-flea, then closes upon it. Many small creatures are thus imprisoned, and when they die their decomposing remains are absorbed by the plant as food. They have personate flowers (similar to those of the Toadflax) with two lips, of which the lower is strangely termed the palate. Further resemblance to Toadflax is afforded by a spur. There are two stamens, inserted on the upper lip, and a short style with two unequal stigma-lobes, which are irritable. The corolla is about $\frac{3}{4}$ of an inch long, yellow; the upper lip broad and short, the palate more prominent, and the spur honeyed. From two to eight blossoms are borne on a scape, which varies in length from 4 to 8 inches, and they are in evidence during July and August. Though generally distributed it is not a common plant.

The other species are :—

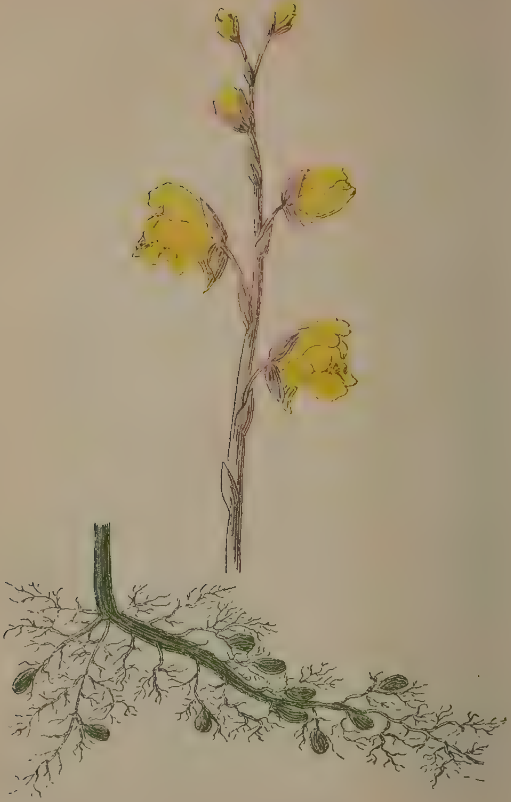
I. Intermediate Bladderwort (*U. intermedia*). Leaves nearly round, close-set in two rows, with awl-shaped segments. Bladders $\frac{1}{8}$ to $\frac{1}{4}$ inch, on slender stalks from leafless branches. The stout scape bears three or four pale yellow flowers, $\frac{1}{2}$ inch long, whose upper lip is twice the length of the palate, spur conical, sharp; July to September. Rare. Dorset, Hants (New Forest), Norfolk, and from Westmoreland to Sutherland; also in Ireland.

II. Small Bladderwort (*U. minor*). Leaves similar to those of last species, but smaller. Bladders $\frac{1}{12}$ inch, on slender stalks from the leaf-axils. Scapes two- to six-flowered. Flowers pale-yellow $\frac{1}{3}$ inch, upper lip as long as the curved palate; spur minute, blunt; June to September. Generally distributed.

The name is from the Latin *utriculus*, a bladder.



Snowdrop.
Galanthus nivalis.
AMARYLLIDACEÆ.



Bladderwort.
Utricularia vulgaris.
LENTIBULARIACEÆ.

Blue-bell or Wild Hyacinth (*Endymion nonscriptum*).

After the daisy, buttercup, and primrose, few wild flowers are better known than the Blue-bell or Wild Hyacinth. In the very earliest days of spring its leaves break through the earth and lay in rosette fashion close to the surface, leaving a circular tube through which the spike of pale unopened buds soon arises. A few premature individuals may be seen in full flower at quite an early date ; but it is not until spring is fully and fairly with us that we can look through the woods under the trees and see millions of them swaying like a blue mist ; or, as Tennyson has finely and truly worded it, "that seem the heavens upbreaking through the earth." This must not be confounded with the Blue-bell of Scotland, which is *Campanula rotundifolia* (*see* page 21).

If we dig up an entire specimen we shall find that, like the hyacinth of the florist, its foundation is a roundish bulb, in this case somewhat less than an inch in diameter at its stoutest part. The leaves have parallel sides, or, as the botanist would say, they are linear ; and before the plant has done flowering they have reached the length of a foot or more, whilst the flower-stalk is nearly as long again. Before the flowers open the buds are all erect, but these gradually assume a drooping attitude ; though when the seeds are ripening the capsule again becomes erect.

The flower is an elongated bell, showing no distinction between calyx and corolla ; it is therefore called a perianth. It consists of six floral leaves, joined together at their bases, the free portions curling back and disclosing the six yellow anthers, which are attached to the sides of the perianth, one to each segment. The ovary is surmounted by the thread-like style, ending in a minute stigma. The capsule is three-celled, and when the seeds are ripe each cell splits down the side to release the shining black seeds.

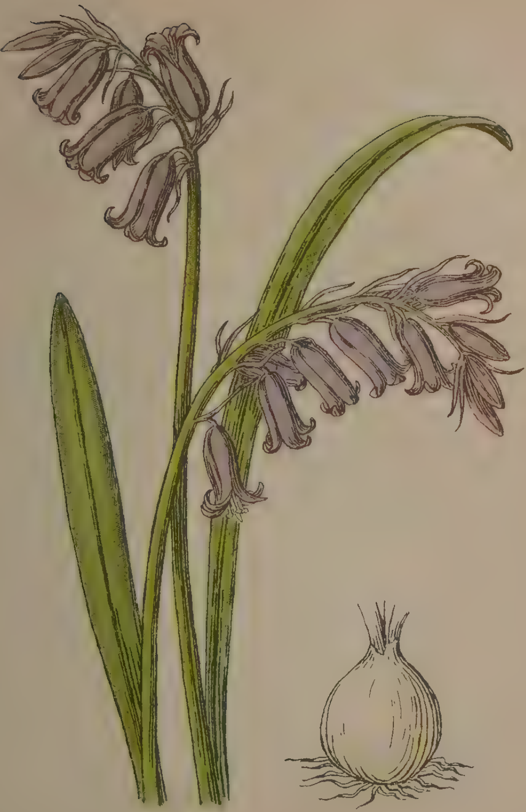
The Genus *Scilla*, in which Blue-bell was included formerly, belongs to the Natural Order Liliaceæ ; its name is from the Greek *Skyllo*, to annoy, in allusion to the bulbs being poisonous There are two native species :—

I. Vernal Squill (*S. verna*). Flower-scapes, one or two, not so long as leaves. Like Bluebell, it has a couple of long bracts at the base of the pedicels, as the short stalks are called, which connect the flowers with the tall scape. This is a rare plant, occurring only in rocky pastures near the west coast from Flint to Devon ; also Ayr and Berwick to Shetland, and in the E. and N.E. of Ireland. April and May.

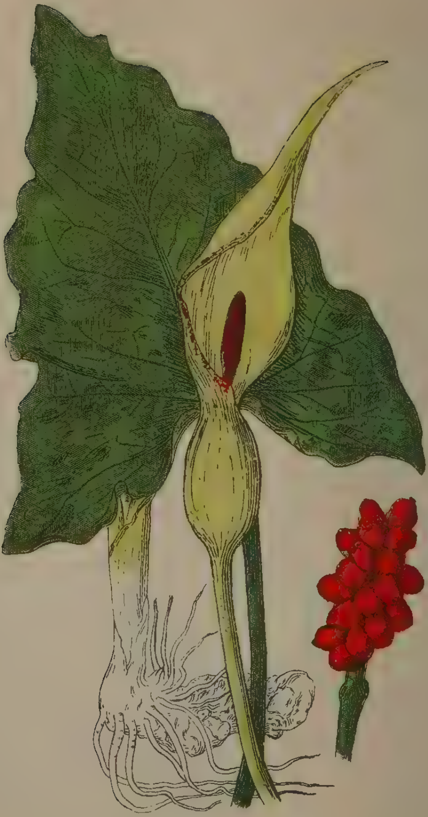
II. Autumnal Squill (*S. autumnalis*) throws up several flower-scapes before the leaves. Flowers, reddish-purple, not drooping, but spreading or erect ; July to September in dry pastures from Gloucester to Cornwall, from Middlesex to Kent. No bracts.

Cuckoo-pint (*Arum maculatum*).

Lords-and-Ladies, Cuckoo-pintle, Priest's-pintle, Calves-foot, Starchwort, Ramp, and Wake-robin are also names by which this very familiar spring plant is known in different localities. Its appearance is remarkable, and its structure no less interesting. About a foot below the surface of woods and hedgebanks is the tuberous rootstock, from which arise above ground in March the handsome arrow-shaped leaves, often spotted with black or purple. From the midst of these leaves in April rises the flower-stalk, bearing an enormous pale green rolled-up bract-leaf, of similar nature to the small thin bract we observed at the base of the footstalks in Blue-bell, but larger than the ordinary leaves. It unrolls and then resembles a monk's-cowl, and also discloses a purplish cylindric column. The green envelope is called a spathe, and must not be taken for a flower. The flowers are there in great number, but they are small and arranged round the lower part of the central column (spadix). The lower third of the spathe is marked off from the rest by a slight constriction, and if with a sharp knife we slice off the front portion of this part, we shall there find the flowers in four series.



Blue-bell.
Endymion nonscriptum.
LILIACEÆ.



Cuckoo-pint.

Arum maculatum.

ARACEÆ.

(Reduced one-half.)

Proceeding downwards we find first a ring of abortive stamens, each ending in a long, deflexed hair. A little lower is a series of perfect anthers, and below these a similar group of pistils, the topmost row of which consists of abortive organs with hair-like processes. Small flies are attracted to the spathe by the carrion-like colour and odour of the spadix, and explore the lower premises. The hairs allow easy descent, but prevent return. If the flies have already been in an Arum flower they bring with them pollen on wings and feet, and find the stigmas ripe to receive it. When these are no longer fit for fertilization the anthers open and discharge their pollen in a shower on the insects; the stigmas secrete honey as a reward to the imprisoned flies, and the upper series of hairs shrivel up and set the insects free to carry their pollen to another Arum.

The spathe and spadix wither, but the ovaries develop into codlin-shaped pale scarlet berries. This species is plentiful throughout the country. There is one other species, *Arum italicum*, found locally from Cornwall to Sussex. It is larger and stouter in all respects; the upper part of the spathe bending over, and the spadix yellow. Flowers in June.

Meadow Saffron (*Colchicum autumnale*).

It is necessary to take care to avoid mental confusion of this species with the Autumn Crocus (page 107). The flower is of crocus-like form, appearing from late summer to autumn whilst its leaves are vernal; points of resemblance sufficiently striking in two plants belonging to distinct Natural Orders. Of course, there are equally striking points of difference that will be sufficient for the ordinarily careful observer to distinguish them.

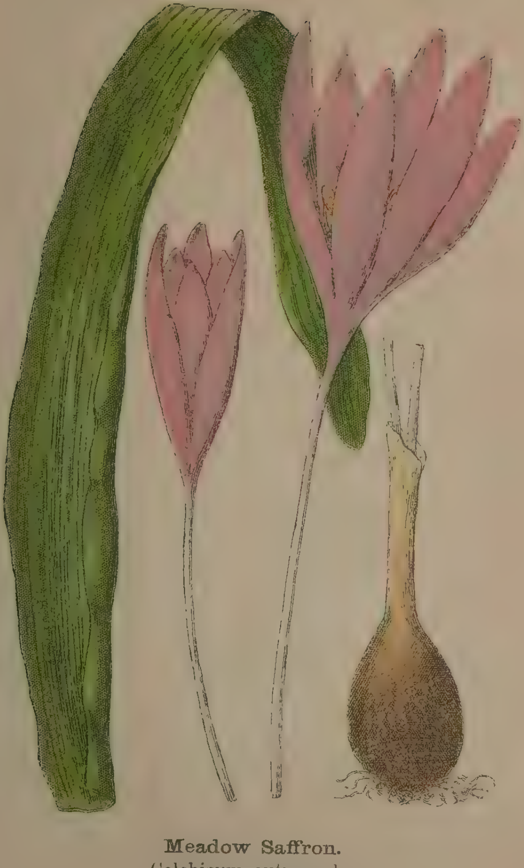
The Meadow Saffron has a large tuberous rootstock, covered with red-brown shining scales. From this in March arise the large, lance-shaped, glossy leaves, often a foot long and an inch wide. These have completed their work and disappeared from view by the time the flowers begin to appear. Owing to this absence of leaves the flowers are in some localities known as Naked Boys or Naked Ladies. Several of them appear in succession from the same root, and they are pale rosy-purple in tint. The tube of the flower is very long and slender, easily collapsing with the weight of the funnel-shaped upper portion (limb), which consists of six segments, as in *Crocus* The ovary is at the bottom of the tube underground, and sends up *three* thread-like styles, whose stigmatic tips curve outwards. These are mature, and have been pollinated by insects coming from older flowers in quest of the nectar, before the six anthers shed their pollen. These (unlike *Crocus*), burst inwards. The spindle-shaped seed vessel remains underground through the winter, and comes up with the leaves in spring to scatter its pale brown seeds. Occasionally, the plant produces imperfect greenish flowers in springtime.

It is the seeds and root of this plant that provide the saffron of the pharmacopœia. The town of Saffron Walden, Essex, got its name from the long-continued cultivation of *Colchicum* in the vicinity. Its natural distribution is local in the area bounded by Westmoreland and Durham in the north to Somerset and Sussex in the south; also in Ireland. In parts of Scotland it has become naturalised.

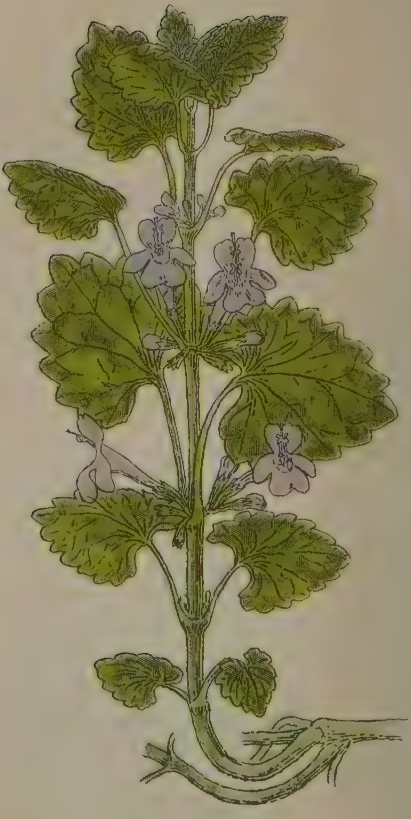
The name of the genus is derived from Colchis in Asia, which was celebrated in classical times for its production of poisonous herbs, in which category Colchicum must be placed.

Ground Ivy (*Nepeta hederacea*).

Trailing among the grass of the copse and hedgebank the Ground Ivy is one of the earliest of flowers to appear in spring. It has not the remotest relationship to the real Ivy (*Hedera helix*), but, like the Dead Nettle, is a labiate plant. The



Meadow Saffron.
Colchicum autumnale.
Liliaceæ.



Ground Ivy.
Nepeta hederacea.
Labiatæ.

slender square stem creeps along the ground, and wherever it puts forth a pair of leaves it sends down a tuft of fibrous roots also. The leaves are roundish, kidney-shaped, deeply round-toothed on the margin. The flowers are in whorls of three to six, borne in the axils of leaf-like bracts. The corolla-tube is long, slender at the base, afterwards dilating, the lower lip heart-shaped and flat. The purple-blue flowers are dimorphic, some being large and perfect, others small and devoid of stamens. They appear from March to June. Other names for it are Ale-hoof and Tun-hoof, from the fact that it was formerly used in brewing, owing to its tonic bitterness.

There is a closely allied, but rare, species called the Catmint (*N. cataria*), which flowers from July to September. This has an erect stem, with leaves approaching more to heart-shape, the teeth sharper ; both stem and leaves downy and whitish. Flowers white, marked with rose-colour.

The name *Nepeta* is the classical Latin one, and is said to have been given because the plant was common round the town of Nepete in Tuscany.

Self-Heal (*Prunella vulgaris*).

A perennial herb of the wayside and the damp pasture, that has fallen upon evil days, so far as reputation is concerned. Time was when it was considered one of the most useful medicines for inward and outward wounds. Culpeper says "he needeth neither physician nor surgeon that hath Self-heal and Sanicle to help himself," and he prints that sentence in italics, to impress it more firmly upon his readers. On this account it was called Carpenter's Herb, Hook-heal, Sickle-wort, and Prunella. The last is a softened form of Brunella, from the German *Bräune* (quinsy), because it was believed to cure that complaint. Its reputation has passed, but the names remain, and one has been adopted as its scientific appellation.

There is a suggestion of the Bugle in its general appearance, but seen together (*see* page 110) there is no danger of mistaking them. In *Ajuga* the whorls are far apart, in *Brunella* they are contracted into a dense head. The corolla here is broader, the upper lip erect and vaulted, whilst in *Ajuga* it is short and notched.

The plant has the square stem, lipped flowers, and four stamens, characteristic of the Labiate order, a creeping root-stock, and stalked leaves ; these are long, oval, toothed, or with entire margins. The bracts of the flower-spike have purple edges. Both leaves and stem are more or less hairy ; the flowers are mostly purple, sometimes white or crimson : July to September. There is a peculiarity in the form of the stamens worth noting. The filament branches at the tip, and one branch bears the anthers whilst the other is pressed against the upper lip. The flowers are dimorphic, large and small—the large perfect, the small having no anthers.

This is the only British member of the genus, whose name has been explained above.

Butcher's Broom (*Ruscus aculeatus*).

Butcher's Broom has no showy flowers to advertise its presence, and it must, therefore, be searched for in its natural *habitats*—woods, copses, and under trees on commons in the south and west. It is so singular a plant that when found it is sure to interest the rambler. Popularly it is said to produce flowers from the middle of the leaf-blade ; but this is not a correct statement, for things are not always what they seem. The seeming leaves are really modified branches (*cladodes*), the true leaves being reduced to minute thin scales at their bases.

Butcher's Broom, Knee Holly, Kneehulver, Kneeholm, or Pettigree belongs to the Lily family, although it is not a bulbous plant, but included with those species — such as

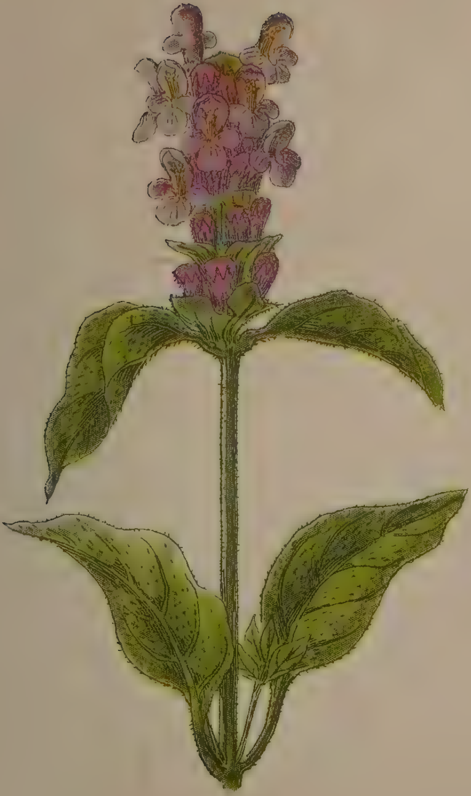
Asparagus, Solomon's Seal, and Lily of the Valley—in which the stem springs from a thick, white, creeping rootstock with "eyes." From these suddenly arise the stems, which are first pale, almost white, and tender, in which condition they are sometimes used in lieu of asparagus; but they soon harden and become tough and evergreen. They reach a height of 2 or 3 feet, and are well furnished with the leaf-like cladodes, sharp-pointed and stiff. It will be noted that the very short stalk of the cladodes is twisted in order to bring those organs into the same plane as the stem. The small greenish-white flowers are $\frac{1}{4}$ inch across, produced from the centre of the cladode, and consist of a six-parted perianth—there being no real distinction between petals and sepals, though the inner three are much narrower than the outer. It is interesting to note that the position of the future flower is marked by a tiny bract when the cladodes of the newly risen stem are still soft and pale. Respecting these flowers there are some slight errors in the text-books. The anther-bearing (male) flowers are borne by a different plant from the pistil-bearing (female) flowers, or on a separate stem from the same rootstock. They are often said to be solitary, stalkless, and persistent. The female flower may be persistent, but the males are not, neither are the latter solitary. Two male buds—occasionally three—are produced in the little pouch of the cladode, and one appears on its footstalk, discharges its pollen, drops off, and is succeeded by the other. The stamens are united by their edges, and of a beautiful violet-purple colour. The female flowers are succeeded by bright red berries, about $\frac{1}{2}$ inch in diameter, which give the shrub an attractive appearance in winter. The flowering period lasts from mid-November until well on in April. Its natural distribution in this country is regarded as bounded on the north by Norfolk, Leicester, and South Wales; beyond that and in Ireland it is considered to be naturalized only.

There is a form with larger, lance-shaped cladodes, and flowers in racemes, sometimes seen in plantations; it is a Portuguese species, *R. racemosus*.

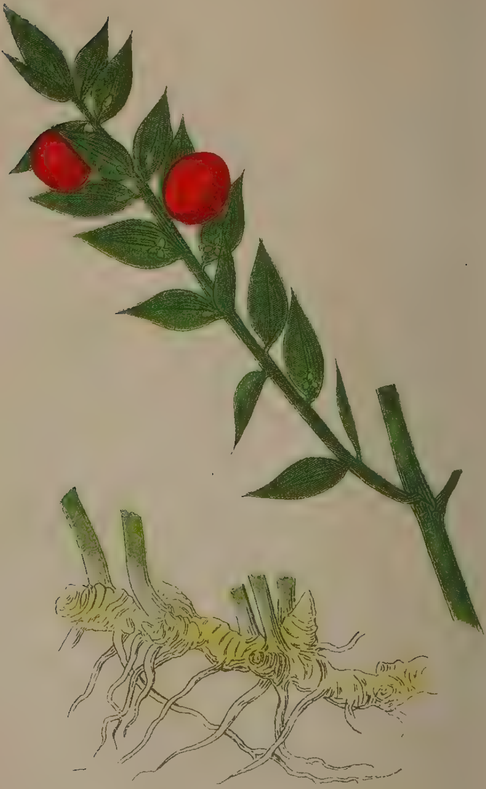
Bog Asphodel (*Narthecium ossifragum*).

The Asphodel is another of the beauties of bogland. It is a small plant, with a long creeping rootstock and stiff, sword-shaped leaves, with sharp flat points, and distinct ribs. These leaves are usually 4 or 5 inches in length, but may be as much as a foot. They are all radical, except that occasionally there may be one or two smaller ones half-clasping the otherwise leafless stems. The flowers are golden yellow, arranged in a raceme. Individually they consist of six perianth-segments, green outside and yellow within. Under the influence of sunshine these spread open widely; and as they remain attached after the fruit has ripened, they make a brave show in the bog for a considerable space of time. There are six stamens, whose awl-shaped filaments are white and hairy, the anthers orange. The ovary is narrow and triangular, with a short style; it develops into a three-sided red capsule. The flowers may be found in July and August, and it is fairly common on wet moors and in boggy hollows on hillsides, where the Sundews, the Marsh St. John's-wort, the Cotton-grass, and many another bog plant grows, with the Cross-leaved Heath close at hand. It is widely distributed, vertically as well as horizontally, for it occurs at an elevation of over 3000 feet in the Highlands. It is the only species.

The name of the genus is from the Greek, *narthekion*, a rod or cane, which can only refer to the flower-stem. Its second or specific name means "bone-breaker," and without some explanation this may seem obscure. Sheep pastured in the places where this plant grows are very likely to contract the rot, and formerly the mischief was debited to the plants growing there. The Marsh Pennywort therefore got the alternative



Self-heal.
Prunella vulgaris.
LABIATÆ.



Butcher's Broom.
Ruscus aculeatus.
LILIACEÆ.
(Reduced one-third.)

2·*Pl.* 121

K 139

name of White Rot, Sundew was called Red Rot, and Asphodel got the appellation in Latin of "bone-breaker."

Clary (*Salvia verbenaca*).

The name Clary is one of those interesting survivals of old times that convey little meaning to modern minds. Dr. Latham suggests that it was originally Claret, and that the name was suggested by the red tint of the upper bracts, which are sometimes more attractive than the flowers. At a later period, when friars and physicians were greatly impressed by the significance of names and the likenesses of animals and plants to organs of the human body, the meaning of the name had got lost, and the best the learned could make of it was that it had originally been *clear-eye*. This agreed upon, it must follow that those who named the plant in the beginning knew that it was good for dimness of vision. Improving upon this position, they called it in Latin *Oculus Christi*, and in English Godes-eie and See-bright. Then, it may be presumed, in the course of their experiments to discover which part of the plant was best to use for the eyes, they found that the seeds are invested by a layer that rapidly absorbs water and becomes mucilaginous. This must be the virtuous element : so they put the seeds into the eye of a patient, and declared that the mucilage picked up particles of dust that had blown in, or that it dissolved any film that was forming over the pupil. "What's in a name?" indeed !

Clary seeds are plentiful, and the reader who happens to get a speck of dust in his eye may try the Clary remedy, but we fear the results will not be encouraging. We have tried it, and kept a seed in the corner of our eye for several hours—in truth, we forgot it was there—but nothing happened either to the eye or the seed.

Clary is a species of sage that grows on dry wastes and in the corners of pastures. It is a perennial with woody rootstock and erect, branched, and leafy stem, 2 feet high, ending in spikes of purple flowers in whorls. The root-leaves are oblong, toothed, and stalked; those from the stem stalkless, oval wedge-shaped, and double-toothed; all are wrinkled. The bell-shaped calyx is relatively large, for it entirely hides the tube of the corolla, which has a compressed short upper lip, and is of a blue-purple colour. The heart-shaped bracts below the flowers often assume a remarkable red-purple tint as referred to in connection with the name. The plant is in flower from June to September.

There is another British species:—

Meadow Sage (*S. pratensis*). A rare plant, found only in Cornwall, Kent, and Oxford, from June to August. The soft wrinkled leaves have the edges cut into convex teeth. The flowers are large and bright blue, in whorls, usually of four or five flowers, on a tall spike.

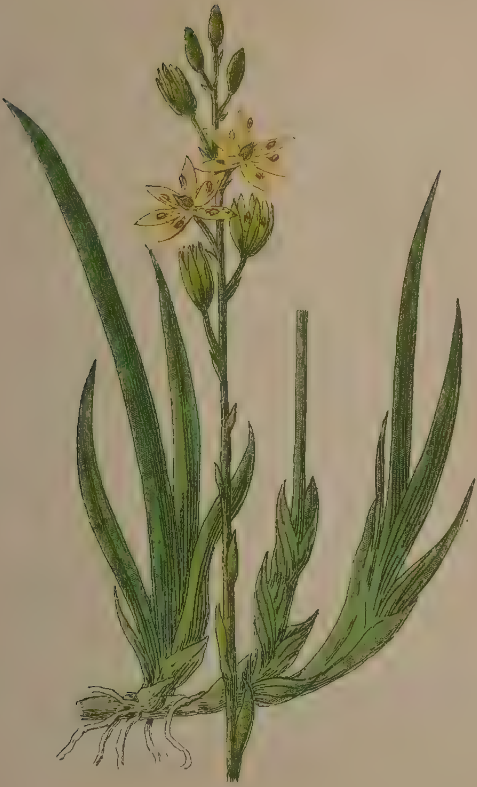
The Sage of the kitchen-garden is *S. officinalis;* not a native plant.

The name *Salvia* is from the Latin *salvo*, to save or heal, from its former great repute in medicine.

Broom-rape (*Orobanche elatior*).

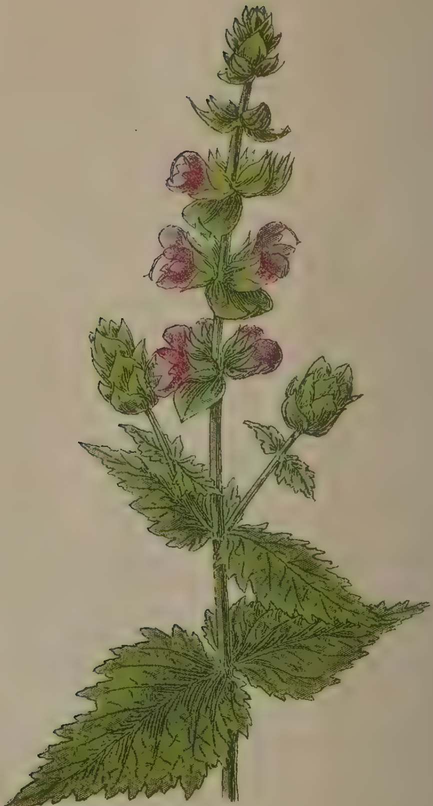
Like Yellow-Rattle, the Broom-rapes—of which there are six British species—are root-parasites, but they differ greatly in appearance from these others. *They* appear to steal only the raw material of which plants are built up, and to elaborate it in their own leaves. As the Broom-rapes have no leaves, nor a particle of the chlorophyll which is absolutely essential to the process of manufacturing cell-material from the elements, it is clear that these must steal the sap of their victim when it has reached the final stage of preparation.

The specific differences in the genus *Orobanche* are not very great, and the "splitter" has made a dozen species out of what others consider may be only two or three, varying according to the structure of the tribe of plants they prey upon. The Greater



Bog Asphodel.
Narthecium ossifragum.
LILIACEÆ.

2 *Pl.* 122 *K* 140



Clary.
Salvia verbenaca
LABIATÆ.

Broom-rape (*O. elatior*) has a stout fleshy stem about 2 feet in height. The whole plant is of a dingy yellow-brown and velvety. There is not a leaf upon it, though there are scales and bracts to represent leaves. The upper part of the stem becomes a spike of large flowers, of somewhat similar build to those of Bartsia; that is, with a two-lipped corolla, the upper erect and two-lobed, the lower spreading and three-lobed, coloured with purple and yellow. There is a large bract under each flower, not so long as the corolla, and the internal arrangements of stamens and pistil are of the same type as in the Scrophularineæ. The stigma is yellow. *O. elatior* is parasitic on the roots of the Great Knapweed (*Centaurea scabiosa*), and flowers from June to August. The other British species are:—

I. Great Broom-rape (*O. major*). Parasitic on Furze, Broom, etc. Brown. Bracts as long as the corolla, which is broader, with lobes less toothed; otherwise similar to *O. elatior*. It is the most widely distributed species. June to August.

II. Clove-scented B. (*O. caryophyllacea*). Parasitic on Bedstraws, Brambles, etc., in Kent. Reddish-brown, about 1 foot high. Stigma dark purple. June.

III. Red B. (*O. rubra*). Parasitic on Thyme, chiefly along west coast of Britain, and in Ireland. Red, less than 1 foot high. Corolla dull red, stigma pale red. June to August.

IV. Lesser B. (*O. minor*). Very variable; on Clovers, Ivy, etc. Stem slender, 2 feet, yellow-brown or purplish. Stigma purple. June to October.

V. Blue B. (*O. cærulea*). Stem slender, 1 foot, purple-blue. Stigma white. Corolla lobes pale blue with darker veins. June to October. Local.

The name is from two Greek words, *orobus*, a vetch, and *agcheo*, to strangle.

Star of Bethlehem (*Ornithogalum umbellatum*).

We have but one species of *Ornithogalum* which botanists admit as truly British, and two others of European origin which have become naturalized in this country. Of these we have selected, not the true Briton, because that is rare and local, but one of the naturalized forms that is more widely distributed. This is, therefore, distinguished as the *Common* Star of Bethlehem. These plants have nearly all the characters of the Squills (*see* page 131), but whereas these have usually blue or purple flowers, of which the perianth early falls off, the flowers of *Ornithogalum* are white, open, and persistent. Otherwise there is the same kind of coated bulb, narrow leaves all radical, withered-looking bracts, perianth of six floral leaves, six stamens with flattened filaments, and a three-valved fruit.

I. Common Star of Bethlehem (*O. umbellatum*) has from six to eight concave leaves, each with a white central stripe springing from a bulb that is about 1 inch in length, producing smaller bulbs all round. The flower-stem is tall (8 to 10 inches), bearing from six to ten flowers in a corymb, the footstalks of the individual flowers almost erect. Blossoms from 1 to 1¼ inch across, the floral-leaves narrow, with a green midrib on the back. Flowers May and June, in woods and meadows.

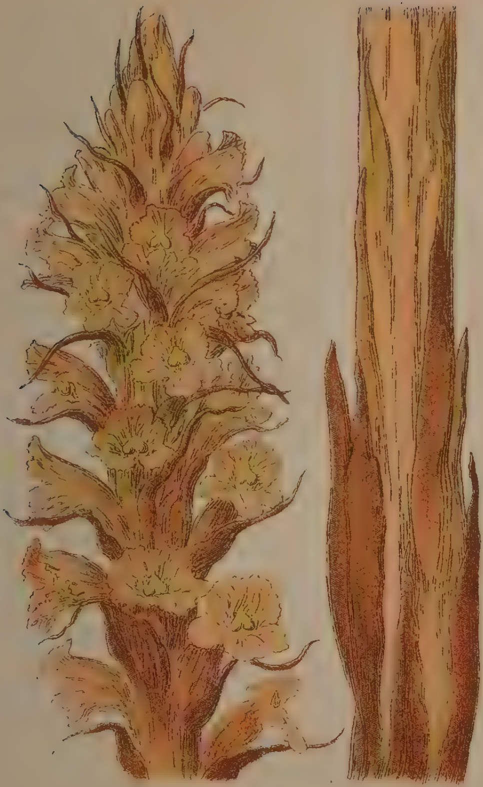
II. Spiked Star of B. (*O. pyrenaicum*) has a bulb 2 inches long, with concave, glaucous leaves, withering when the flowers have come. Flower-stem stout and as much as 2 feet in length, the flowers in a raceme, their footstalks spreading outwards, but becoming erect as the fruit develops. Flowers 1 inch across, greenish, with a white margin to the floral leaves on the inner side. Flowering June and July. This is the true native, and is found in woods and copses locally in the counties of Somerset, Wilts, Beds, Berks, and Sussex. Young shoots sometimes sold and eaten under the name of French Asparagus.

III. Drooping Star of B. (*O. nutans*). Much more local than the last, being confined to the districts between Yorkshire, Durham, and Hereford. It has a 2-inch bulb, leaves 1 to 2 feet, concave, glaucous, with a white stripe, a 2-feet flower-stem. Flowers few, white with green midrib, as much as 1 to 1½ inch across, in a raceme, their footstalks curving downwards, so that the flowers nod. April and May.

The name is the same as that used by the ancient Greeks for the plant, and it is derived from *ornithos*, a bird, and *gala*, milk, but its significance is not obvious.

Mouse-ear Hawkweed (*Hieracium pilosella*).

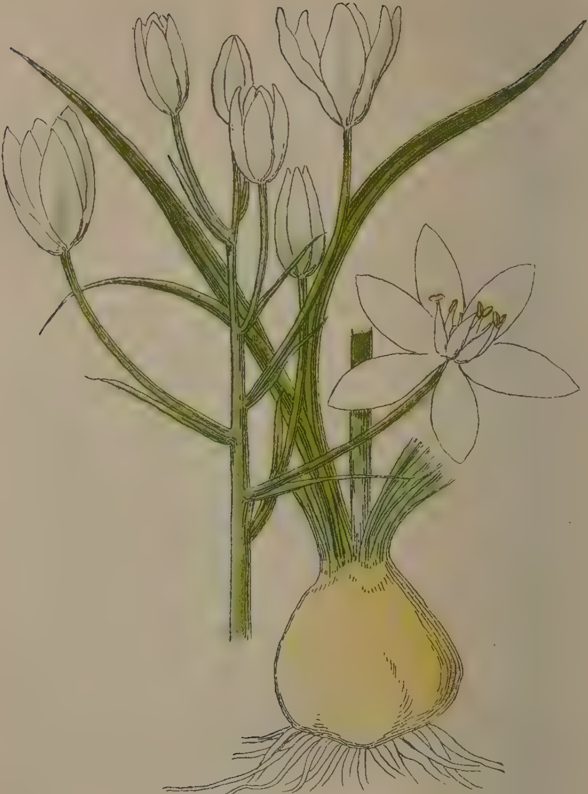
Wandering over dry pastures and commons in summer we shall certainly see the flowers of this bright little weed freely distributed over the turf. Too commonly it is regarded by the non-botanical as a mere depauperated specimen of the dandelion ; in fact, all low-growing yellow flowers of this type are popularly regarded as dandelions. The genus *Hieracium* is the despair of the ordinary botanist, for the splitter has been at work on it, and has made over a hundred species out of the ten that Hooker gives, and which Bentham reduces to five.



Greater Broomrape.
Orobanche elatior.
OROBANCHACEÆ.

2 *Pl.* 124

K 142



Star of Bethlehem.
Ornithogalum umbellatum.
Liliaceæ.

Of nine out of his ten Hooker says, "I believe there are no characters whereby the nine forms, from *alpinum* to *boreale* inclusive, can be more than approximately defined." So gradually do these forms merge into each other that it is impossible for the average botanist to keep the nice distinctions in mind. They have, however, all been described by Mr. F. J. Hanbury in his "Illustrated Monograph of the British Hieracia," to which we refer the reader who wishes to make a close acquaintance with the group.

Hieracium pilosella has a creeping rootstock, sending off leafy runners. The leaves are alternate, downy beneath and with long hairs scattered over the upper surface. The flower-stem is generally leafless, but sometimes has two or three small leaves upon it; its top is downy, and there are glandular hairs among the down. The flower-head is solitary, with a somewhat bell-shaped involucre, the rays of the florets smooth, pale lemon-yellow, with red or brown stripes beneath. Flowers from May to August.

There is a similar plant with orange flowers, naturalized in Scotland and the North of England, where it is known as Grim-the-Collier (*H. aurantiacum*), on account of the black hairs with which the involucre and flower-stem are clothed. It is an escape from gardens. Flowers June to August.

The name is from the Greek, *hierax*, a hawk, it being formerly supposed that birds of prey used the juice of this plant to sharpen their vision.

Common Hemp Nettle (*Galeopsis tetrahit*).

The Hemp Nettle is one of a group of Labiate plants that too frequently get confused in the public mind with Dead Nettle (*Lamium*), on account of the superficial resemblance of their foliage, and the similar squareness of stems and opposite branches. The Woundwort, the Hemp Nettle, and Dead Nettle come particularly close together, and are separated into different genera, chiefly on account of small differences in the structure of the calyx and the forms of the fruit. In *Galeopsis* the calyx is nearly bell-shaped, with five equal spiny teeth. The corolla-tube is straight, with a divided throat; the upper lip egg-shaped and arched, the lower three-lobed, with erect teeth where the lobes unite. To pass from the genus to the commonest species, *G. tetrahit* is distinguished by its bristly stem, which is much swollen beneath the *nodes*, whence the leaves and branches are given off. Its stature is about 3 feet. The leaves large, very coarsely toothed, on long stalks. The flowers are in dense whorls around the upper part of the stem, with leafy bracts beneath them. The teeth of the calyx are very long, straight and awl-shaped, equalling or exceeding the length of the calyx-tube. The corolla is in the type purplish or white, but there is a sub-species (*G. speciosa*) in which the colour is yellow and purple. It flowers from July to September, and may be looked for round about cultivated ground generally. There are two other species :—

I. Red Hemp Nettle (*G. ladanum*), with downy stems, the nodes *not* thickened. The calyx-teeth are not longer than the tube. The corolla is rosy-purple, hairy, and with mottlings of crimson and yellow on the lower lip. July to October, on chalky and gravelly soils. Less common than *tetrahit*.

II. Downy Hemp Nettle (*G. dubia*). The last-mentioned is downy, but this is more so, the soft hairs of *ladanum* becoming glandular in *dubia*. The leaves also are broader, more deeply toothed, the calyx-teeth are not so spiny, and the large corollas are pale yellow, rarely purple or white. It is of local occurrence in sandy cornfields, and very rare. July and August.

The name is from the Greek words, *galée*, a weasel, or cat, and *opsis*, appearance, from the resemblance between the upper lip of the corolla, seen sideways, and a weasel's head.

FAMILY CHARACTERS OF BRITISH PLANTS

Described in this volume.

Daisy Family (*Compositæ*).

The characters of this Family were given in Series I., page 164. We have now only to make an addition to the illustrative genera described and figured in the present volume. They are: *Tanacetum* (p. 18), *Petasites* (p. 2), *Arctium* (p. 19), *Carduus* (p. 12), *Helminthia* (p. 6), *Hieracium* (p. 142), *Lactuca* (p. 3), *Sonchus* (p. 15), and *Tragopogon* (p. 13).

Willow Herb Family (*Onagraceæ*).

The proper position of this family is following the Loosestrife Family (*see* Series I., p. 160). All the native species are herbs, with opposite or alternate leaves without stipules. Flowers regular, two- or four-parted; calyx superior, with two or four lobes; petals two or four, distinct, inserted at top of the calyx-tube. Stamens two, four, or eight, inserted with the petals. Ovary usually four-celled, with a thread-like style ending in a simple or four-lobed stigma. Fruit, a drupe, a berry, or a capsule with four cells.

Illustrative genera: *Epilobium* (p. 97), and *Circæa* (p. 38).

Bellflower Family (*Campanulaceæ*).

Herbs with milky juice, and alternate leaves without stipules. Flowers secreting honey, and discharging pollen before stigmas are mature. Calyx with the limb cut into five lobes, superior or half superior. Corolla in one, inserted on the calyx, five-lobed. Stamens five ; anthers meeting round the style and discharging their pollen against it. Ovary two- to eight-celled, style simple, stigmas two to eight, packed together until lengthening of style carries them clear of the ring of anthers, when they spread apart. Fruit a berry, or dry capsule, two or more celled, opening by lateral fissure, or by two or three valves at the top. Seeds many.

Illustrative genera : *Jasione* (p. 23), *Wahlenbergia* (p. 11), and *Campanula* (pp. 21, 47).

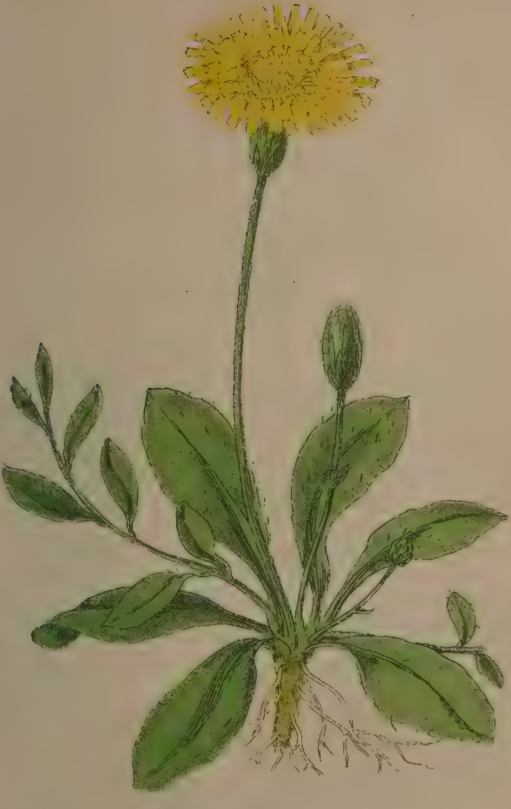
Heathwort Family (*Ericaceæ*).

Trees, shrubs, or herbs, mostly evergreen shrubs, with undivided leaves without stipules. Flowers regular, or but slightly irregular. Calyx four- or five-parted. Corolla bell-shaped, with four or five teeth or lobes ; occasionally with distinct petals. Stamens four to ten, the anthers opening by terminal pores or slits. Ovary four- or five-celled with terminal style and simple or lobed stigma. Fruit, a berry, or three- to five-valved capsule, with three to five cells.

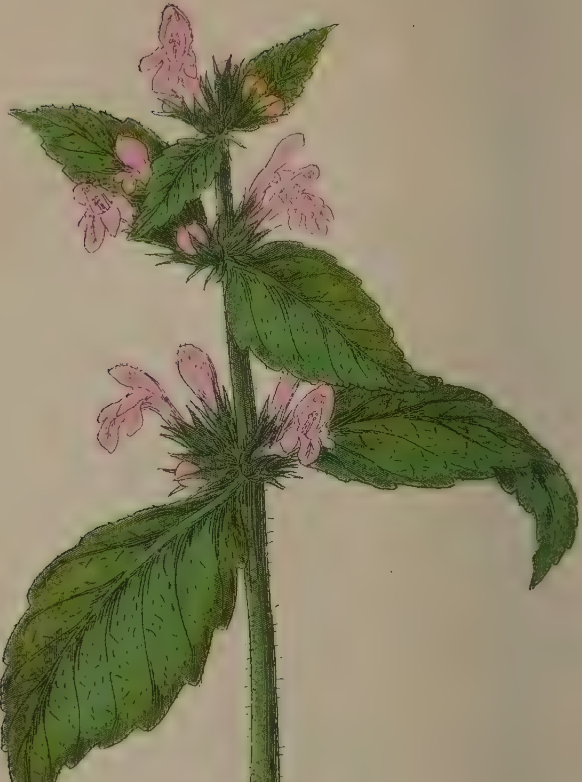
Illustrative genera : *Vaccinium* (p. 29), *Erica* (p. 4), *Calluna* (p. 32), and *Pyrola* (p. 62).

Thrift Family (*Plumbaginaceæ*).

Herbs, with alternate or radical leaves, without stipules. Flowers regular with bracts. Calyx inferior, tubular, the limb five-cleft, often coloured. Petals five, with long claws. Stamens



Mouse-ear Hawkweed.
Hieracium pilosella.
COMPOSITÆ.



Hemp Nettle.
Galeopsis tetrahit.
LABIATÆ.

2 *Pl* 127 *L* 147

five, opposite the petals, with thread-like filaments. Ovary one-celled, styles five. Fruit membranous, enclosed in the calyx-tube, one-seeded.

Illustrative genera: *Limonium* (p. 36) and *Statice* (p. 16).

Primwort Family (*Primulaceæ*).

Perennial (chiefly) or annual herbs, with radical or stem leaves (without stipules). Flowers regular. Calyx four- to nine-cleft (mostly five-cleft and inferior). Corolla wheel-shaped, bell-shaped, or funnel-shaped, usually five-cleft. Stamens five, attached to corolla-tube opposite the lobes, sometimes alternating with equal number of aborted stamens (*staminodes*). Ovary one-celled, with simple style and undivided stigma. Fruit, a one-celled capsule.

Illustrative genera: *Primula* (pp. 35, 37), *Lysimachia* (pp. 32, 68), *Glaux* (p. 77), *Anagallis* (pp. 14, 40), and *Hottonia* (p. 42).

Periwinkle Family (*Apocynaceæ*).

Herbs or undershrubs, with opposite, entire leaves. Flowers solitary. Calyx with four or five long-pointed lobes. Corolla salver-shaped or funnel-shaped, with oblique lobes. Stamens four or five, attached to corolla-tube. Ovary of two carpels; style short, dilated above.

Illustrative genus: *Vinca* (p. 39).

Gentian Family (*Gentianaceæ*).

Herbs, annual or perennial, with entire and mostly opposite leaves, without stipules. Flowers regular, solitary or in cymes. Calyx inferior, with four to eight teeth or lobes. Corolla wheel-shaped, bell-shaped, or funnel-shaped, with four to eight lobes

Stamens four to eight, attached to corolla-tube. Ovary one- or two-celled with simple style and divided stigma. Fruit, a two-valved capsule.

Illustrative genera: *Blackstonia* (p. 60), *Erythræa* (p. 49), *Gentiana* (p. 94), *Menyanthes* (p. 53), and *Limnanthemum* (p. 89).

Borage Family (*Boraginaceæ*).

Herbs, usually rough or hairy. Stems round, leaves alternate and entire, without stipules. Flowers in cymes. Calyx with five parts or lobes. Corolla wheel-shaped, tubular, bell-shaped, or salver-shaped. Stamens five, attached to the corolla. Ovary of two two-celled carpels, with simple style. Fruit of four nutlets.

Illustrative genera: *Echium* (p. 50), *Symphytum* (p. 53), *Anchusa* (p. 58), *Lithospermum* (p. 54), *Myosotis* (p. 63), and *Cynoglossum* (p. 67).

Bindweed Family (*Convolvulaceæ*).

Herbs, usually twining, often with milky juice. Leaves alternate or absent, without stipules. Flowers variously clustered, or solitary. Sepals four or five. Corolla regular, tubular, bell-shaped or funnel-shaped. Stamens five, attached to corolla-tube; anthers arrow-shaped. Ovary two- to four-celled, with slender style, stigmas two to four. Fruit, a two- to four-valved capsule.

Illustrative genera: *Convolvulus* (p. 69) and *Cuscuta* (p. 17).

Nightshade Family (*Solanaceæ*).

Herbs or shrubs, with alternate or opposite leaves, without stipules. Flowers regular, solitary or in cymes. Calyx inferior with five teeth or lobes. Corolla wheel-shaped, bell-shaped, or salver-shaped, with five lobes. Stamens five, attached to the corolla-tube, alternating with the lobes. Ovary two- or four-celled, with simple style, and simple or lobed stigma. Fruit, a berry or capsule.

Illustrative genera: *Solanum* (p. 71) and *Atropa* (p. 80).

Plantain Family (*Plantaginaceæ*).

Annual or perennial herbs, with mostly radical parallel-ribbed leaves. Flowers regular, green, usually in spikes. Sepals four. Corolla thin, dry and semi-transparent, with four spreading lobes. Stamens four, attached to corolla-tube, with hair-like filaments, and large versatile anthers. Ovary two- to four-celled with thread-like style; the stigmas consisting of two lines of hairs. Fruit, a one- to four-celled capsule.

Illustrative genus: *Plantago* (p. 112).

Figwort Family (*Scrophulariaceæ*).

Herbs, with opposite or alternate leaves. Flowers mostly irregular, variously grouped. Calyx inferior, of five parts. Corolla four- or five-lobed, wheel-shaped, two-lipped, closed, bell-shaped, or tubular. Stamens four (occasionally two or five), attached to corolla-tube. Ovary two-celled, with simple and head-like or two-lobed stigma. Fruit, a capsule.

Illustrative genera: *Verbascum* (p. 119), *Linaria* (pp. 66, 84), *Scrophularia* (p. 125), *Digitalis* (p. 1), *Veronica* (p. 7), *Bartsia* (p. 85), *Euphrasia* (p. 59), *Rhinanthus* (p. 90), *Pedicularis* (p. 34), and *Melampyrum* (p. 92).

Broomrape Family (*Orobanchaceæ*).

Leafless root-parasites. Stem scaly. Flowers in spikes. Sepals four or five, inferior. Corolla irregular, curved, two-lipped.

Stamens four, attached to the corolla-tube. Ovary one-celled, of two carpels ; style simple, curved, with two-lobed stigma. Fruit, a two-valved, one-celled capsule.

Illustrative genera : *Lathræa* (p. 82), and *Orobanche* (p. 140).

Butterwort Family (*Lentibulariaceæ*).

Marsh or aquatic herbs with radical leaves, without stipules. Flowers solitary or racemed, irregular. Calyx two-lipped or five-parted. Corolla two-lipped, closed or open. Stamens two, anthers two-valved. Ovary one-celled, with short thick style, and two-lipped stigma. Fruit, a capsule, two-valved, or bursting irregularly.

Illustrative genera: *Pinguicula* (p. 87) and *Utricularia* (p. 129).

Vervain Family (*Verbenaceæ*).

Herbs, with opposite or whorled leaves, without stipules. Flowers irregular. Calyx inferior, tubular, two-lipped. Corolla tubular, two-lipped. Stamens four, attached to the corolla-tube. Ovary two- to four-celled, style simple. Fruit, a berry, a drupe, or four nutlets.

Illustrative genus : *Verbena* (p. 74).

Mint Family (*Labiatæ*).

Glandular herbs or shrubs with square branches, and opposite or whorled leaves, without stipules. Flowers irregular, solitary or in crowded cymes. Calyx inferior, five-cleft, and ribbed. Corolla five-parted, two-lipped. Stamens, four perfect and one imperfect, attached to corolla-tube ; anthers discharge pollen before stigmas are mature. Ovary of two-lobed carpels, four-celled ; style slender, springing from between the four lobes ;

stigma simple or divided. Fruit of one to four single-seeded nutlets.

Illustrative genera: *Mentha* (p. 27), *Lycopus* (p. 106), *Origanum* (p. 99), *Thymus* (p. 108), *Calamintha* (p. 101), *Salvia* (p. 139), *Nepeta* (p. 134), *Prunella* (p. 135), *Scutellaria* (p. 103), *Stachys* (p. 111), *Galeopsis* (p. 143), *Lamium* (pp. 109, 113), *Teucrium* (p. 44), and *Ajuga* (p. 110).

Goosefoot Family (*Chenopodiaceæ*).

Herbs or shrubs, with alternate, undivided leaves, without stipules. Flowers small, regular, green; often dimorphic. Calyx inferior, of three to five sepals, joined or distinct. Petals not present. Stamens five, opposite the sepals. Ovary one-celled; styles one to five. Fruit, bladder-like, membranous.

Illustrative genus: *Chenopodium* (p. 86).

Buckwheat Family (*Polygonaceæ*)

Herbs, with alternate leaves and sheathing membranous stipules. Flowers with jointed footstalks. Sepals, three to six; petals not present. Stamens five to eight, opposite the sepals. Ovary egg-shaped, three-sided or compressed; styles one to three. Fruit, one-seeded, compressed, or three-sided, or winged.

Illustrative genus: *Polygonum* (pp. 100, 104).

Mezereon Family (*Thymelæaceæ*).

Herbs, shrubs, or trees, with acrid juice, and entire leaves, without stipules. Flowers, solitary, bundled, or in cymes; honeyed and odorous. Perianth inferior, tubular, four- or five-lobed. Stamens two to ten within the tube. Ovary one- or two-celled; style with stigmatic head. Fruit, a drupe or berry.

Illustrative genus: *Daphne* (p. 77).

Spurge Family (*Euphorbiaceæ*).

Herbs, shrubs, or trees, often with milky juice, and usually alternate simple leaves, without stipules. Flowers small, stamens and pistils usually in separate flowers. Male flowers with one or more stamens; ovary, rudimentary or absent. Female flowers with a two- or three-celled ovary, and two or three styles. Fruit, a two- or three-celled ovary, with one or two seeds in each cell.

Illustrative genera: *Euphorbia* (p. 116) and *Mercurialis* (p. 122).

Nettle Family (*Urticaceæ*).

Herbs, shrubs, or trees, with opposite or alternate leaves, usually with stipules. Sexes usually in separate small green flowers. Perianth, with three to eight lobes or parts. Stamens corresponding in number with and opposite the lobes. Ovary one- or two-celled. Fruit, various.

Illustrative genus: *Humulus* (p. 91).

Bog Myrtle Family (*Myricaceæ*).

Shrubs or trees with alternate simple leaves. Sexes in separate flowers, which have no perianth, and are in spikes. Male flowers consisting of two to sixteen stamens in a bract. Female flowers consisting of a one-celled ovary with two thread-like styles which are stigmatic throughout, enclosed in two to four bracteoles. Fruit, a rough drupe containing a one-seeded "stone."

Illustrative genus: *Myrica* (p. 56).

Frog-bit Family (*Hydrocharidaceæ*)

Aquatic herbs with opposite or whorled leaves. The sexes usually on separate plants, the six-parted perianth enclosed in one or more spathes. The male perianth in two series, the inner three often petal-like ; stamens on the perianth three or more. Female perianth superior, with rudimentary stamens and a one- to six-celled ovary, with three or six styles. Fruit, usually a one- to six-celled berry.

Illustrative genera : *Hydrocharis* (p. 123), and *Stratiotes* (p. 96).

Orchid Family (*Orchidaceæ*).

Perennial herbs with tuberous or fleshy roots, and leaves (mostly radical) whose bases sheath the stem. Flowers irregular, solitary, or in spikes, racemes, or panicles. Perianth superior, of six-coloured segments, of which the three outer (*sepals*) are the most uniform ; the inner (*petals*) are unequal, the lateral ones forming a pair, but the third (*lip*) is usually larger, more or less lobed, and often ending in a hollow spur. The stamen and style are united to form the *column*. There is a single anther attached to the larger sepal (except in *Cypripedium*, which has two anthers opposite the petals), two-celled, each cell containing one or more pear-shaped masses of pollen (*pollinia*) with footstalks (*caudicles*), whose base is a sticky gland. Ovary long and often twisted, three-sided and one-celled ; style often ending in a beak (*rostellum*) below the anther and above the stigmatic surface of the column which faces the lip. Fruit, a three-valved capsule, containing a vast number of minute spindle-shaped seeds. *Note.*—The lip is the uppermost petal, which is brought to its usual lowest position by the twisting of the ovary or its footstalk.

Illustrative genera : *Neottia* (p. 24), *Spiranthes* (p. 102), *Epipactis* (p. 73), *Cephalanthera* (pp. 73, 126), *Orchis* (p. 78), *Ophrys* (p. 116), *Habenaria* (p. 114).

Flag Family (*Iridaceæ*).

Perennial herbs with tuberous, bulbous or creeping rootstocks, and mostly sword-shaped leaves. Flowers with a perianth of six segments in two series, but all coloured and petal-like. Stamens three. Ovary three-celled, style simple, ending in three stigmas which are often dilated. Fruit, a three-sided, three-celled, three-valved capsule.

Illustrative genera: *Crocus* (p. 107), and *Iris* (p. 75).

Daffodil Family (*Amaryllidaceæ*).

Perennial herbs with bulbous roots, and leaves all radical, long, slender, straight-sided (*linear*). Flowers at first enclosed in large dry bracts (*spathes*). Perianth of six parts, united or free, in two series. Stamens six, attached to the tube or segments. Ovary egg-shaped or round, three-celled; style thread-like or columnar, stigmas one to three. Fruit, a three-celled, three-valved capsule.

Illustrative genera: *Narcissus* (p. 118), *Galanthus* (p. 128), *Leucojum* (p. 129).

Yam Family (*Dioscoreaceæ*).

Perennial climbing herbs, often with tuberous rootstock. Stems twining from right to left, with alternate leaves. Flowers small, greenish, in panicles or racemes; sexes in separate flowers; the female flower superior. Perianth regular, of six segments in two series. Stamens six, attached to perianth-segments. Ovary three-celled, styles three, short. Fruit, usually three-sided and three-celled, but in the British representative a berry.

Illustrative genus: *Tamus* (p. 48).

Lily Family (*Liliaceæ*).

Perennial herbs or shrubs with bulbous or creeping rootstocks. Flowers usually complete, occasionally the sexes separate. Perianth of six segments in two series (segments rarely four, eight, or ten), petal-like. Stamens six (three only in *Ruscus*), attached to the perianth or springing from beneath the ovary. Ovary three-celled ; styles one or three ; stigma simple or three-lobed. Fruit, a capsule or berry, usually three-celled.

Illustrative genera : *Ruscus* (p. 136), *Allium* (p. 41), *Scilla* (p. 131), *Ornithogalum* (p. 141), *Fritillaria* (p. 127), *Narthecium* (p. 138), *Colchicum* (p. 133), and *Paris* (p. 72).

Rush Family (*Juncaceæ*).

Herbs, mostly perennial, with creeping scaly rootstock. Stems erect, usually unbranched, and filled with pith. Leaves slender, flat, or rounded, sometimes reduced to scales that sheath the stem. Flowers small, regular, green or brown, in cymes, with bracteoles. Perianth inferior, segments six in two series, dry or leathery. Stamens six or three, attached to bases of segments. Ovary one- to three-celled ; style short or absent ; stigmas three, thread-like. Fruit, a one- to three-celled capsule with three valves.

Illustrative genera : *Juncus* (p. 85) and *Luzula* (p. 9).

Reed Mace Family (*Typhaceæ*).

Marsh and aquatic perennial herbs with creeping rootstocks and narrow (*linear*) radical leaves with sheathing bases. Perianth of scales or hairs which persist, in cylindrical spikes or rounded heads, the sexes in different flowers on the same stems ; male heads uppermost. Male flowers with few or many stamens with slender filaments. Female flowers consisting of a one- or two-celled ovary with simple style. Fruit, a drupe, or minute.

Illustrative genera : *Sparganium* (p. 124) and *Typha* (p. 93).

Cuckoo-pint Family (*Araceæ*).

Perennial herbs with tuberous or creeping rootstocks and radical leaves. Flowers small, round a spadix which is invested by a spathe. Perianth segments six, or absent. Stamens various. Ovary one- or more celled ; style simple or absent ; stigma a head or disk. Fruit, a one- or more celled berry.

Illustrative genus : *Arum* (p. 117).

Duckweed Family (*Lemnaceæ*).

Annual aquatic plants, scale-like, rarely producing seed ; propagated in summer by buds, and in autumn by hibernating bulbils. Vessels absent or rudimentary ; roots (when present) sheath-tipped. Flowers minute, rarely found ; one to three in a spathe. There is no perianth, merely one or two stamens, and a one-celled ovary with a short style. Fruit, a bottle-shaped bladder (*utricle*) containing one or more seeds.

Illustrative genera : *Lemna* (p. 45) and *Wolffia* (p. 45).

Arrow-head Family (*Alismaceæ*).

Marsh or aquatic perennial herbs, with chiefly radical leaves. Flowers mostly complete (in *Sagittaria* the sexes are in separate flowers) in panicles or umbels. Perianth inferior, of six segments in two series. Stamens six, nine, or more, attached below the ovary. Ovary of three, six, or more carpels ; styles short or wanting ; stigma simple or feathered. Fruit of leathery carpels or follicles without valves.

Illustrative genera : *Alisma* (p. 26), *Sagittaria* (p. 28), and *Butomus* (p. 120).

Pond-weed Family (*Naiadaceæ*).

Marsh or aquatic herbs, usually with creeping rootstocks, and long, slender, branched, and jointed stems. Leaves alternate or in two rows (but rarely opposite), sheathing the stem by their bases; sometimes with sheathing stipules. Flowers small, green, mostly with the sexes separate. Perianth, when present, various. Stamens attached below the ovary, which is of one to four carpels with one style. Fruit of utricles, nutlets, or drupes.

Illustrative genus: *Potamogeton* (p. 5).

Bulrush Family (*Cyperaceæ*).

Rush-like, usually perennial, herbs, with solid often three-sided stems. Leaves long, slender, with tubular sheaths. Flowers, one- or two-sexual in small bracts (*glumes*), arranged in spikelets. Glumes concave, the lower one in each spikelet often empty. Perianth, when present, of three, six, or more scales or bristles. Stamens one to six from below the ovary; filaments flat, anthers projecting from the spikelets. Ovary one-celled, surrounded by one or two little bracts (*perigynium*), style one, protruded from the spikelet, with two or three thread-like stigmas. Fruit small, compressed or three-sided.

Illustrative genera: *Scirpus* (p. 22), *Eriophorum* (p. 64), and *Carex* (p. 31).

Grass Family (*Gramineæ*).

Slender herbs, mostly tufted. Stems cylindrical or compressed, jointed, usually hollow between the joints. Leaves slender, alternate, the lower part forming a sheath round the stem or younger leaves. Flowers in glumes and spikelets: a spikelet is usually composed of two empty glumes, within which is one or more flowering glumes. The spikelets are arranged in spikes, racemes, or panicles. The flowering glumes are boat-shaped, containing a one- or two-sexual flower, and a flat scale called a *palea*, with turned-in edges. The perianth is usually of two minute scales, opposite the palea. Stamens usually three (occasionally one, two, six, or more), filaments hair-like, anthers hinged in the middle (*versatile*). Ovary one-celled, stigmas usually two, feathery. Fruit, a membranous utricle, containing one seed.

Illustrative genera: *Anthoxanthum* (p. 88), *Alopecurus* (p. 50), *Phleum* (p. 20), *Ammophila* (p. 70), *Lagurus* (p. 121), *Phragmites* (p. 105), and *Briza* (p. 52).

CLASSIFIED INDEX

TO

NATURAL ORDERS, GENERA AND SPECIES

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